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JULY 15, 1982

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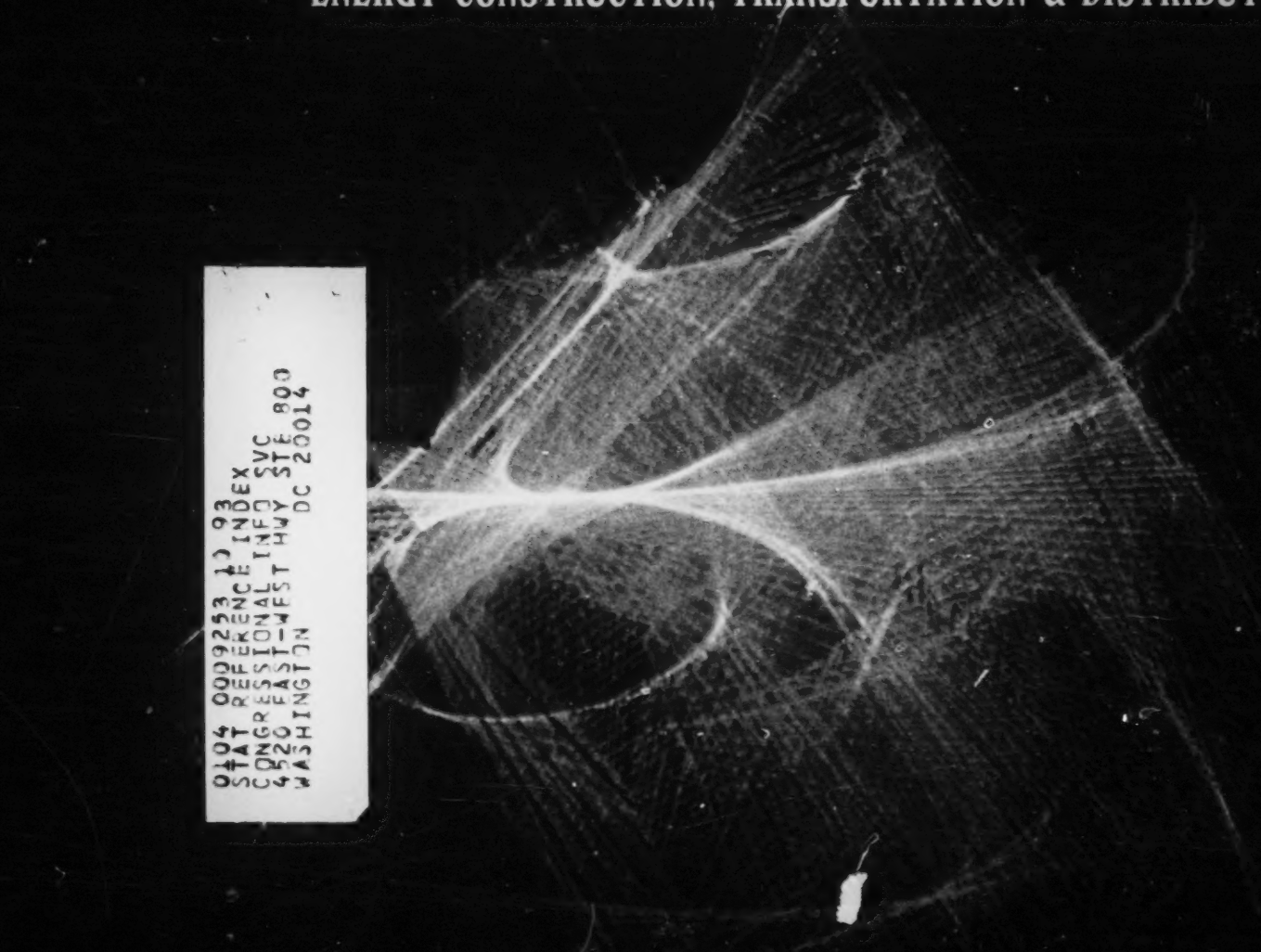

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ENERGY OPERATIONS & EQUIPMENT FORECAST

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PIPELINE & GAS JOURNAL

ABOUT THE COVER: Computer-enhanced graphics are becoming increasingly important to the petroleum industry which is rapidly adapting electronic, high-speed calculation to such areas of energy operations as seismic sites, rig floors, compressor stations, and pipeline rights of way.

Overview of Oil/Gas Operations, Supply/Demand, and Technical Advances

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9 1982 Worldwide Pipeline Construction Will Top 21,900 Miles, $9.5 Billion
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12 Distribution Expenditures Reach $2.48 Billion in 1982
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For further information about any equipment, supplies or services mentioned in this issue, circle the number of the ad or item on one of the postage paid cards in front or back of this issue and mail. Our computer center sends your request to the company that will provide the information you want.

Send me further details on items corresponding to code numbers circled below:

July 15, 1982 issue; Reader Service for this issue expires December 31, 1982

| | | |

– photo courtesy Westcoast Transmission Company, Ltd.

1982 Worldwide Pipeline Construction Will Top 21,900 Miles, $9.5 Billion

by Dean Hale, *Editor*
Pipeline & Gas Journal

Nearly 106,000 miles of crude oil, refined products, natural gas liquids, natural gas, carbon dioxide, and slurry pipelines are planned or under construction around the globe at mid-1982. That includes 73,000 miles of planned or underway lines in the free world and 33,000 miles of planned or underway lines in the Soviet Bloc countries and China,

During 1982, some 21,900 miles are projected to be completed worldwide, at a cost of $9.5 billion. In the United States, over 10,100 miles of cross-country pipelines will be installed at a cost of over $2.7 billion. In the free world outside of the U.S., another 11,800-plus miles will be completed, at a cost exceeding $6.8 billion.

Total pipeline market expenditures during 1982 – including new construction, maintenance and operations, cathodic protection, general facilities, construction and automative equipment, and all other items – will exceed $13.03 billion.

Pipeline construction activity in 1982 has slowed slightly because of lowered economic activity worldwide, and there are lessened expectations for the remainder of 1982, with an upturn forecast for 1983. Need for new pipelines to transport increasing amounts of oil and gas energy now being discovered, plus use of pipelines to transport other commodities in increasing amounts, has created a backlog of demand for facilities that must be built sometime.

1982 PIPELINE CONSTRUCTION

(Estimated miles to be completed during year)

	U.S.	International	Total
Gas			
Transmission	4022	4311	8333
Field, Gathering, Storage	2180	1740	3920
Carbon Dioxide	750	–	750
Totals	**6952**	**6051**	**13003**
Crude Oil			
Trunk Pipelines	373	1520	1893
Gathering	1496	1533	3029
Totals	**1869**	**3053**	**4922**
Refined Products			
Refined Products	488	1193	1681
LPG/Gas Liquids	330	714	1044
Totals	**818**	**1907**	**2725**
Offshore			
Oil	110	327	437
Gas	425	480	905
Totals	**535**	**807**	**1342**
GRAND TOTAL	**10174**	**11818**	**21992**
Prime Movers (est. HP Installed)			
Compressor HP	387,000	690,000	1,077,000
Pump HP	196,000	158,000	354,000
Total	**583,000**	**848,000**	**1,431,000**

Commodities suited for pipeline transportation and getting consideration include crude oil; refined products; natural gas liquids; LPG; coal slurries; carbon dioxide (used for enhanced oil recovery); chemicals such as ammonia, ethane, ethylene, and similar petrochemical feedstocks; industrial gases such as oxygen, nitrogen; and solids slurries such as ores, wood chips, and other non-soluble minerals, even items such as wood chips and wood pulp for paper-making.

Trends in the U.S. in 1982 include the building of several major carbon dioxide gas pipelines – including the 402 mile, 20 and 24-in. Sheep Mountain Line from Walsenburg, Colo. to West Texas for ARCO; the 503-mile, 30-in. Cortez Line from Cortez, Colo. to Denver City, Texas, and a 114-mile line in Oklahoma for ARCO. Several other projects are expected to be announced in late 1982 or in 1983.

The major "super projects" on the planning boards are being delayed for a variety of reasons. While over one-third of the total "Alaska Highway Gas Pipeline Project" has been completed or will be completed this year, the remaining 48-in. section in Alaska and 48 and 56-in. sections in Canada will be delayed another two years because the pipeline's backers are experiencing difficulty in financing the remainder of the $33 billion project.

Future of the 1500-mile, 40 and 42-in. Northern Tier Pipeline to carry crude oil from Washington State to Minnesota depends on success of the venture to overcome action by state officials in Washington that denied the line access to a port in the Puget Sound area.

Slurry pipeline construction is expected to get underway in early 1983 when Energy Transportation System, Inc.'s 1450-mile, 40-in. system begins installation. Curently there are 10,396 miles of coal slurry pipeline planned for the U.S. and 500 miles in Canada.

In the U.S., major projects underway in the gas transmission pipeline field include the 797-mile, 36-in. Trailblazer system in Nebraska, Wyoming, Colorado and Utah, being built for Natural Gas Pipeline Co. of America, Colorado Interstate Gas Co., and Mountain Fuel Supply Co. Red River Pipeline's 360-mile, 24-in. line is nearing completion in West Texas, and United Texas Transmission is completing a 43-mile, 30-in. line. The final 188 miles of the Northern Border Pipeline 42-in. system will be completed this year. Panhandle Eastern has 150 miles of 4 thru 12-in. underway while Valero Transmission is building 46 miles of 24 and 30-in. in South Texas. Columbia Gas has 85 miles of 20-in. in Virginia and West Virginia and another 100-plus miles planned for this year.

In the products/LPG/NGL area, MAPCO has underway 210 miles of pipeline – in the form of 105 miles of dual 4 and 6-in. line in Kansas while Ashland Oil is building 80 miles of 8-in. in Ohio.

Crude pipeline activity includes Chevron's 100 miles of 12-in. in California; Getty's 27 miles of insulated 20-in. line; ARCO's 80 miles of 4 thru 40-in. underway in Alaska on the North Slope, and Kuparuk Pipeline's 27-mile, 24-in. insulated line, also on the North Slope.

Canada expects 1982 to be a second year of high volume big-inch construction with some 785 miles of gas lines to be built plus some 1600 miles of smaller diameter lines including some 600 miles of gathering lines plus about 300 miles of gas liquids lines. Biggest projects include Foothills' 128 miles of 42-in. in southern Alberta; 128 miles of 42-in. by TransCanada PipeLines in eastern Manitoba and northwestern Ontario; a 253-mile, 42-in. "short cut" line from North Bay to Morrisburg for TCPL; and 92 miles of 24-in. for Trans Quebec & Maritimes Pipeline Inc.

Internationally, the really big projects underway or ready to begin work include the 155-mile, 20-in. NGL line in Scotland between St. Fergus and Mossmoran; 310 miles of 20 and 30-in. offshore line offshore Denmark for Danish Oil and Natural Gas, which is readying its plans for 1100 miles of mainland pipelines and 7500 miles of distribution lines.

Ireland's 160 miles of 18-in. gas line is presently underway, as are 390 miles of 42 and 48-in. for Trans-Mediterranean Pipeline in northern Italy. Norway's 530 miles of 28 and 30-in. line connecting Statfjord Field to Karsto on the mainland, then back to Ekofisk in the southern part of the North Sea.

In France, Gaz de France has nearly 200 miles of 18 to 32-in. line underway, and in West Germany, work includes 30 miles of gas lines and 83 miles of 22-in. oil line from Wilhelmshaven to Hamburg.

Construction in the Middle East includes 200 miles of gas lines in Oman, 40 miles in Qatar, and 240 miles in Saudi Arabia. North Africa construction includes a 265-mile, 48-in. gas line in Algeria, plus a 393-mile, 30-in. oil line. In Libya, work is progressing on 350 miles of 34-in. crude line.

Australian pipeline construction includes 415 miles of 14-in. gas liquids line from Moomba south to port, plus 250 miles of gathering lines in the Moomba area. Awaiting construction contract awards is the 925-mile, 20 and 26-in. Perth to Dampier gas pipeline. Work on the offshore 80-mile, 40-in. gas line in the North west Shelf area is underway.

Southeast Asia projects include 110 miles of 24-in. gas pipeline in Bangladesh and 37 miles of 20-in. gas line in Indonesia.

In Mexico, work is underway on some 277 miles of 16 to 24-in. gas transmission lines and 278 miles of 8, 10, and 12-in. products lines. In Panama, the trans-Isthmus oil line – 78 miles of 36 and 40-in. pipeline – is nearing completion, as is a 40-mile, 6-in. products line in Costa Rica.

Work in South America includes 51 miles of 12-in. gas line and 51 miles of 24-in. oil line offshore Brazil; 22 miles of gas line and 25 miles of products line in Chile; 100 miles of gas pipeline and 200 miles of crude oil pipeline in Colombia; 45 miles of oil pipeline in Peru, and 144 miles of 10 to 26-in. gas pipelines in Venezuela, plus 125 miles of 6 thru 24-in. oil pipelines.

And work on one of the most-discussed projects in the world, the Yamal pipeline that will bring gas 3300 miles from Siberia through a 56-in. line, has not yet been begun by the Soviets. Much of the material has been contracted for the line, but final arrangements await final contracts with western European nations. ■

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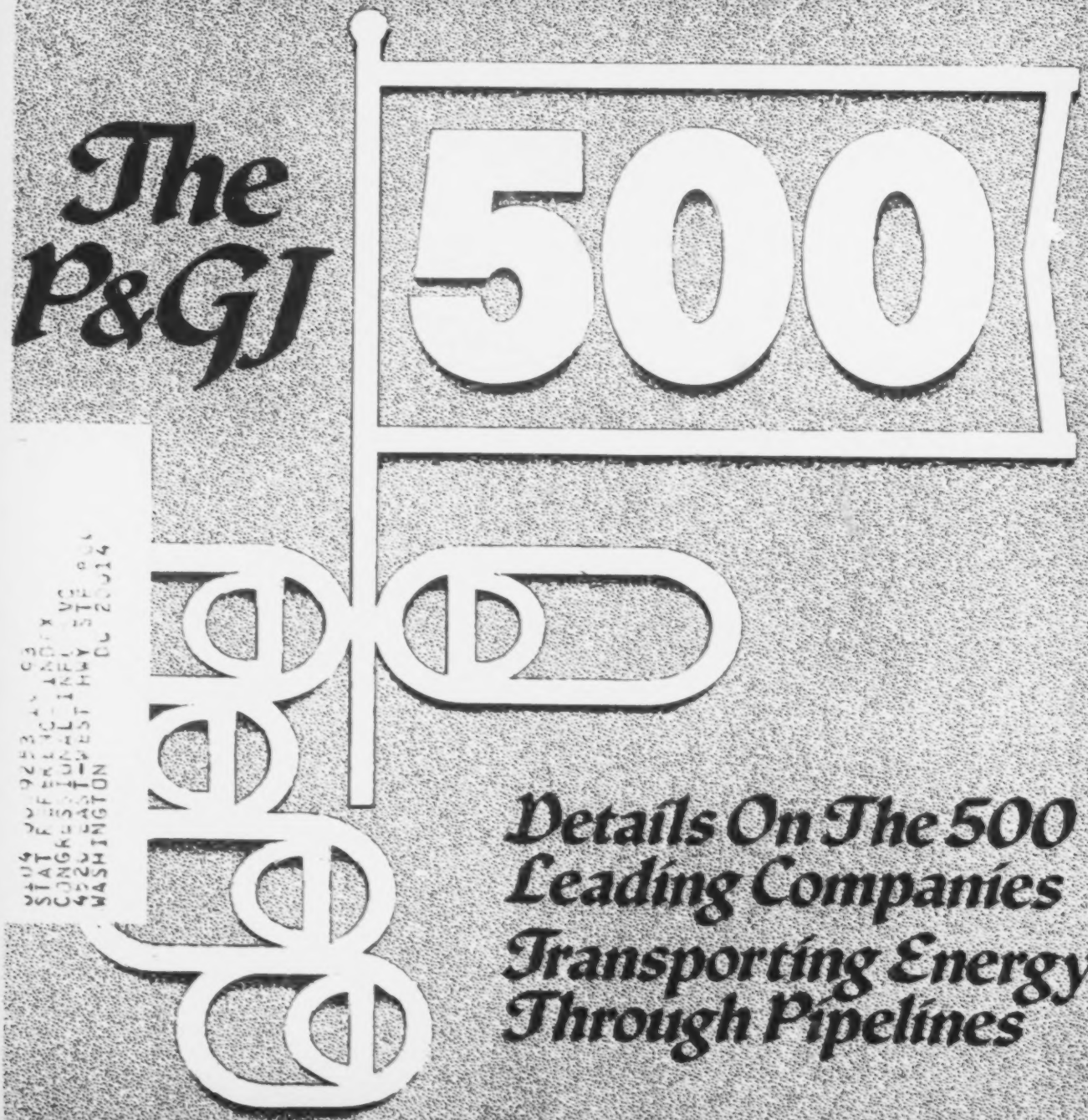

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Details On The 500 Leading Companies Transporting Energy Through Pipelines

PIPELINE & GAS JOURNAL

International Pipeline & Gas Utility Design, Construction & Operation

Published Continuously Since 1859

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Second annual report on American oil and gas pipelines and gas distribution utilities provides definitive details on the operations and physical plant of the nation's leading 300 gas distribution utilities, the 100 leading gas transmission pipelines, and the 100 leading liquid (crude oil and refined products) pipelines.

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The 2nd P&GJ 500

Dimensions Of The 500 Leading Companies Transporting Energy Through Pipelines

by Dean Hale, *Editor*

Continuing changes in energy demand, energy prices, and energy flow patterns are reflected in the data provided by the nation's 500 leading firms that move hydrocarbon energy through pipelines.

The 1982 edition of the P&GJ 500 Report, second of its type ever done, provides a definitive reading on the dimensions of the energy pipeline network that covers all 50 states and involves nearly 2300 owner/operator entities and more than 1,460,000 miles of liquids pipelines, gas transmission pipelines, and gas mains and services.

Included in the P&GJ 500 Report are the 300 leading gas distribution utilities, the 100 leading gas transmission pipelines, and the 100 leading liquids (crude oil and products) pipelines. These firms represent the industry's leaders – they operate over 76% of the liquids pipeline mileage, 79% of the gas pipeline mileage, and serve over 97% of the nation's gas utility customers.

The P&GJ 500 Report gives details on revenues, gas sales (in MMcf per year), number of customers, net income, plant value, capital expenditures in terms of plant additions, and physical facilities in terms of miles of gas mains or miles of pipelines.

Gas Distribution Utilities. The leading 300 gas distribution utilities range in size from 3,853,931 customers to 2338 customers. The top 300 operate over 81% of the nation's gas main mileage. Again in 1981, the top two utilities were in California – Southern California Gas Co. and Pacific Gas & Electric Co. In the top 10 utilities in revenues, an increase of 22.5% ($3,860,937,000) was reported. In gas sales, the 10 leaders reported an increase of 6.3% – and additions to plant were also up 22.5%. The top 10 also reported a 6% increase in miles of mains.

Gas Transmission Pipelines. The top 10 gas transmission pipeline companies (see tables) reported an increase of 32.6% in revenues ($7.165 billion) in 1981 over 1980, a 12.8% increase in Mmcf gas sales; and an increase of 41.7% in additions to plant (up $567,276,000).

El Paso Natural Gas Co. in 1981 ranked first in revenues, first in MMcf gas sales, and seventh in plant additions; Columbia Gas Transmission ranked second in revenues, third in MMcf sales, and first in plant additions. Transco was third in revenues, seventh in MMcf sales: Tennessee Gas Pipe Line was fourth in revenues, second in MMcf sales, and third in plant additions.

Liquids Pipelines. Despite decreases in total barrels of products or crude oil handled, revenues were up for liquids pipelines in 1981. The top 10 liquids pipelines reported an increase of 3% in revenues; the top 10 products pipelines reported a decline of 4.2% in bbl of products delivered; the top 10 crude oil pipelines had a decline of 5.82% in bbl delivered.

The following summary tables provide an overview of the "top 10" companies in numerous categories; the complete tabular presentation gives a more complete dimensional measure of the P&GJ 500 companies.

The 10 Biggest Spenders – Gas Distribution Utilities (not including integrated companies)

Rank 80	Rank 81	Company Name	1981 Additions To Plant, $(000)
2	1	Southern California Gas Co.	172,898
—	2	Consolidated Gas Distribution Companies	75,802
—	3	Washington Gas Light Co.	70,925
1	4	Northern Illinois Gas Co.	69,462
6	5	Public Service Electric & Gas Co.	67,874
4	6	Consolidated Edison Co. of N.Y.	65,337
5	7	Brooklyn Union Gas Co.	53,698
7	8	Peoples Gas Light & Coke Co.	52,382
—	9	Philadelphia Gas Works	41,005
9	10	Atlanta Gas Light Co.	39,665

The 10 Biggest Spenders – Gas Transmission Pipelines (not including integrated companies)

Rank 80	Rank 81	Company Name	1981 Additions To Plant, $(000)
4	1	Columbia Gas Transmission Co.	231,278
2	2	Michigan Wisconsin Pipeline Co.	223,984
5	3	Tennessee Gas Pipe Line Co.	221,076
—	4	Northwestern Pipeline Corp.	212,634
1	5	Northern Natural Gas Co.	208,460
—	6	Texas Eastern Transmission Corp.	203,355
—	7	El Paso Natural Gas Co.	195,719
—	8	Pacific Gas Transmission Co.	173,132
9	9	Southern Natural Gas Co.	132,412
10	10	United Gas Pipe Line Co.	123,699

The 10 Biggest Spenders – Liquids Pipeline Companies

Rank 80	Rank 81	Company Name	1981 Additions To Plant $(000)
—	1	Locap, Inc.	121,061
2	2	MAPCO, Inc.	42,775
1	3	Colonial Pipeline Co.	39,245
10	4	Gulf Pipe Line Co.	31,106
—	5	Four Corners Pipe Line Co.	27,000
6	6	Exxon Pipe Line Co.	21,974
8	7	Amoco Pipeline Co.	21,761
—	8	Kaneb Pipe Line Co.	20,835
3	9	Arco Pipe Line Co.	20,378
7	10	Sohio Pipe Line Co.	19,320

The P&GJ 500 ... dimensions of the pipeline energy business

The Top 10 In Revenues – Gas Distribution Utilities

Rank 80	Rank 81	Company Name	1981 Revenues, $(000)
2	1	Public Service Electric & Gas	3,471,652
1	2	Southern California Gas Co.	3,333,784
3	3	Columbia Gas Distribution Co.'s	2,397,640
—	4	Pacific Gas & Electric Co.	2,288,702
—	5	Lone Star Gas Co.	1,800,399
5	6	Northern Illinois Gas Co.	1,794,297
—	7	Consolidated Gas Distribution Co.'s	1,787,297
—	8	Michigan Consolidated Gas Co.	1,682,033
—	9	Consumers Power Co.	1,264,807
8	10	Peoples Gas Light & Coke Co.	1,187,650

The Top 10 Gas Distribution Utilities In Miles of Mains

Rank 80	Rank 81	Company Name	Miles of Main
1	1	Southern California Gas Co.	38,272
2	2	Pacific Gas & Electric Co.	29,751
3	3	Columbia Gas Distribution Co.'s	27,666
4	4	Northern Illinois Gas Co.	23,636
5	5	Entex	21,542
—	6	Consolidated Gas Distribution Co.'s	20,526
—	7	Consumers Power Co.	19,404
7	8	Atlanta Gas Light Co.	16,427
8	9	Arkla, Inc.	14,914
—	10	The Gas Service Co.	12,828

The Top 10 In Revenues – Gas Transmission Pipelines

Rank 80	Rank 81	Company Name	1981 Revenues $(000)
1	1	El Paso Natural Gas Co.	3,531,024
2	2	Columbia Gas Transmission Co.	3,429,591
4	3	Transcontinental Gas Pipeline Corp.	3,336,582
3	4	Tennessee Gas Pipeline Co.	3,276,649
5	5	United Gas Pipeline Co.	3,252,103
—	6	Pacific Gas & Electric Co.	2,954,715
—	7	Natural Gas Pipeline Co. of America	2,546,835
6	8	Texas Eastern Transmission Corp.	2,334,210
7	9	Michigan Wisconsin Pipe Line Co.	2,294,557
—	10	Valero Transmission Corp.	2,144,242

The Top 10 Gas Distribution Utilities In MMcf Gas Sales

Rank 80	Rank 81	Company Name	Sales In MMcf
3	1	Columbia Gas Distribution Co.'s	1,204,549
1	2	Southern California Gas Co.	910,103
2	3	Pacific Gas & Electric Co.	531,293
4	4	Lone Star Gas Co. (Enserch)	527,425
5	5	Northern Illinois Gas Co.	508,033
—	6	Consolidated Gas Distribution Co.'s	499,278
6	7	Michigan Consolidated Gas Co.	423,191
8	8	Consumers Power Co.	362,858
—	9	Arkla, Inc.	330,147
10	10	Peoples Gas Light & Coke Co.	291,758

The Top 10 Gas Transmission Pipelines In MMcf Gas Sales

Rank 80	Rank 81	Company Name	1981 Sales, MMcf
2	1	El Paso Natural Gas Co.	1,263,962
3	2	Tennessee Gas Pipeline Co.	1,138,605
4	3	Columbia Gas Transmission Co.	1,123,610
5	4	United Gas Pipe Line Co.	1,062,438
-	5	Houston Natural Gas Co.	1,025,624
-	6	Natural Gas Pipeline Co. of America	936,467
6	7	Texas Eastern Transmission Corp.	935,129
7	8	Transcontinental Gas Pipe Line Corp.	901,939
-	9	Pacific Gas & Electric Co.	812,624
8	10	Northern Natural Gas Co.	717,556

The Top 10 Gas & Electric Utilities – by Gas Customers

Rank 80	Rank 81	Company Name	No. of Customers	1981 MMcf Sales	Miles of Mains
1	1	Pacific Gas & Electric Co.	2,897,455	531,293	29,751
2	2	Public Service Electric & Gas Co.	1,309,793	202,572	12,503
3	3	Consumers Power Co.	1,159,154	362,858	19,404
4	4	Consolidated Edison Co. of N.Y.	1,017,330	88,360	4,197
5	5	Public Service Co. of Colo.	677,663	143,658	9,504
6	6	Northern Indiana Public Service Co.	526,761	261,393	10,204
8	7	San Diego Gas & Electric Co.	513,683	89,095	5,048
7	8	Baltimore Gas & Electric Co.	512,389	105,582	4,246
9	9	Niagara Mowhawk Power Co.	424,278	109,758	5,968
10	10	Long Island Lighting Co.	395,194	48,362	5,826

The 10 Largest Integrated Gas Utilities

Rank 80	Rank 81	Name of Company	No. of Customers	MMcf Sales	Miles of Mains	Miles of Trans. Lines	Additions To Plant $(000), 1981
1	1	Pacific Gas & Electric Co.	2,897,455	910,103	29,751	5,070	95,522
2	2	Lone Star Gas Co. (Enserch)	1,185,786	527,425	2,785	11,480	75,777
3	3	Consumers Power Co.	1,159,154	362,858	19,404	1,276	38,148
4	4	Michigan Consolidated Gas Co.	1,053,105	423,191	12,739	2,327	71,282
5	5	Arkla, Inc.	717,742	330,147	14,914	9,194	89,620
6	6	National Fuel Gas Distribution Co.	669,822	202,775	6,367	5,183	44,144
7	7	Oklahoma Natural Gas Co. (ONEOK, Inc.)	603,416	366,476	10,318	4,763	34,972
8	8	Mountain Fuel Supply Corp.	406,127	117,595	8,878	1,929	94,300
9	9	Southwest Gas Corp.	346,138	43,239	6,180	1,607	28,064
10	10	Pioneer Corp. (Energas)	280,350	124,788	3,636	12,970	45,099

The P&GJ 500 ... dimensions of the pipeline energy business

The Top 10 Liquids Pipeline Companies – In Mileage

Rank 80	Rank 81	Company Name	Total Miles Of Pipeline
1	1	Amoco Pipeline Co.	12,325
2	2	Mobil Pipeline Co.	11,820
3	3	Exxon Pipeline Co.	9,143
5	4	Arco Pipeline Co.	8,218
4	5	Williams Pipeline Co.	8,144
6	6	Shell Pipe Line Co.	7,822
7	7	MAPCO, Inc.	7,769
8	8	Continental Pipe Line Co.	7,326
9	9	Phillips Pipe Line Co.	5,697
10	10	Colonial Pipeline Co.	5,241

The Top 10 Products Pipeline Companies

Rank 80	Rank 81	Company Name	1981 Deliveries, (000) Bbl Products
1	1	Colonial Pipeline Co.	625,406
—	2	Sohio Pipe Line Co.	309,887
2	3	Buckeye Pipeline Co.	250,932
4	4	Southern Pacific Pipelines Co.	226,870
3	5	Gulf Pipe Line Co.	203,738
5	6	Marathon Pipe Line Co.	195,468
6	7	Plantation Pipe Line Co.	168,024
8	8	Williams Pipe Line Co.	165,253
—	9	Phillips Pipe Line Co.	164,690
7	10	Texas Pipe Line Co.	151,170

The Top 10 Crude Pipelines

Rank 80	Rank 81	Company Name	1981 Deliveries, (000) Bbl Crude
1	1	Arco Pipe Line Co.	505,848
2	2	Exxon Pipeline Co.	466,227
3	3	Lakehead Pipe Line Co.	406,771
4	4	Shell Pipe Line Co.	388,573
5	5	Amoco Pipeline Co.	357,578
6	6	Marathon Pipe Line Co.	298,798
7	7	Texas Pipe Line Co.	287,925
8	8	Sohio Pipe Line Co.	263,106
9	9	Gulf Pipe Line Co.	249,246
10	10	Mobil Pipe Line Co.	242,832

The Top 10 Liquids Pipelines – Revenues

Rank 80	Rank 81	Company Name	1981 Revenues $(000)
1	1	Sohio Pipe Line Co.	1,155,294
2	2	Arco Pipe Line Co.	848,121
3	3	Exxon Pipeline Co.	802,164
4	4	BP Pipelines Inc.	583,841
5	5	Colonial Pipeline Co.	394,452
7	6	Amoco Pipeline Co.	162,733
6	7	Mobil Alaska Pipeline Co.	143,086
—	8	Mobil Pipeline Co.	139,546
9	9	Williams Pipeline Co.	139,250
10	10	Shell Pipeline Co.	136,419

The 300 Leading Gas Distribution Utilities

Rank S1	Rank S2	Name of Company	Number of Customers	1981 Gas Sales, MMcf	1981 Oper. Revenues $(000)	1981 Net Income $(000)	Gas plant value (000) 12-31-81	Additions to plant $(000)	Miles of Mains	Miles of Services
1	1	Southern California Gas	3,853,931	910,103	3,333,784	116,010	1,468,069	172,898	38,272	36,430
2	2	Pacific Gas & Electric Co.	2,897,455	531,293	2,288,702	133,307	1,149,109	95,522	29,751	23,616
3	3	Columbia Gas Distribution Cos.[K]	1,901,802	626,028	1,386,283	50,000[E]	675,000[E]	60,000[E]	27,666[E]	18,112[E]
—	4	Consolidated Gas Distribution Co.[I]	1,487,602	499,278	1,787,297	90,812	1,482,786	75,802	20,526	20,012
4	5	Northern Illinois Gas Co.	1,451,420	508,033	1,794,734	81,035	1,608,278	69,462	23,636	19,141
5	6	Public Service Electric & Gas Co.	1,309,793	202,572	3,471,652	264,137	1,063,006	67,874	12,503	12,392
6	7	Entex Inc.[B]	1,198,521	172,416	981,647	42,858	464,354	32,416	21,542	12,485[L]
7	8	Lone Star Gas Co.	1,185,786	527,425	1,800,399	107,472	812,072	49,054	2,785	30,964
8	9	Consumers Power Co.	1,159,154	362,858	1,264,807	85,795	1,224,158	38,148	19,404	12,075[E]
9	10	Brooklyn Union Gas Co.	1,061,922	111,947	746,944	39,223	674,206	53,698	3,729	5,215

A. 1980 data
B. Fiscal year ending 6-30-81
C. Fiscal year ending 9-30-81
D. Gas and electric combined
E. Estimated
F. Includes off system sales
G. Fiscal year ending 8-31-81
H. Gross
I. Fiscal year ending 10-31-81
J. Gas and water combined
K. Includes seven companies
L. Includes five companies

The P&GJ 500 ... dimensions of the pipeline energy business

Rank '81	Rank '82	Name of Company	Number of Customers	1981 Gas Sales MMcf	1981 Oper. Revenues $1000	1981 Net Income $1000	Gas plant value 1000 12-31-81	Additions to plant $1000	Miles of Mains	Miles of Services
10	11	Michigan Consolidated Gas Co.	1,053,105	423,191	1,682,093	18,970	922,595	71,282	12,709	13,784[E]
11	12	Consolidated Edison Co. of N. Y. Inc.	1,017,330	88,360	548,125	45,133	615,894	65,337	4,197	2,591
13	13	The Peoples Gas Light & Coke Co.[C]	878,109	291,758	1,187,650	42,725	931,730	52,382	4,031	5,115
14	14	The Gas Service Co.	851,297	193,138	601,771	9,708	272,026	22,917	12,828	5,554
15	15	Atlanta Gas Light Co.	819,616	226,059	829,539	14,010	535,342	39,665	16,427	14,673
16	16	Arkla, Inc.	717,792	330,147	976,069	87,560	987,446	89,620	14,914	7,477[E]
18	17	Public Service Co. of Colorado	677,063	143,658	1,219,291[D]	101,242	321,160	18,288	9,504[F]	7,058[E]
17	18	National Fuel Gas Dist. Corp.[I]	669,822	202,775	828,358	16,330	440,598	27,390	6,367[E]	6,379[F]
19	19	Oklahoma Natural Gas Co.[G]	603,416	268,177	719,558	22,168	541,249	21,792	10,318	1,264
21	20	Minnesota Gas Co.	567,464	139,969	513,385	16,447	229,221	18,993	7,963	4,934
22	21	Washington Gas Light Co.	564,042	112,876	557,977	19,244	677,387	70,925	6,726	7,965
24	22	Laclede Gas Co.	543,239	110,682	431,962	13,750	244,422	25,960	6,089	5,774
23	23	Philadelphia Gas Works[R]	534,168	84,325	437,931	8,890	516,610	41,005	2,983	3,210
25	24	Northern Indiana Public Service	526,761	261,393	844,390[D]	80,416	83,616	N/A	10,204	9,495
27	25	San Diego Gas & Electric Co.	513,683	89,095	333,104	17,758	162,406	17,797	5,048	4,094
26	26	Baltimore Gas & Electric Co.	512,389	105,582	1,421,056	149,659	351,079	18,251	4,246	4,391
28	27	Boston Gas Co.	481,049	74,197	442,418	24,331	316,141	13,148	5,666	4,202[E]
29	28	Niagara Mohawk Power Corp.	424,278	109,758	430,785	220,643	370,608	32,819	5,968	4,027
30	29	Wisconsin Gas Co.	407,969	121,376	531,769	13,961	370,966	16,553	5,900	N/A
31	30	Mountain Fuel Supply Co.	406,127	117,595	354,600	13,400	787,300	94,300	8,878	4,876
32	31	Long Island Lighting Co.	395,194	48,362	260,010	22,051	346,027	14,829	5,826	4,116[E]
33	32	Illinois Power Co.	383,474	948,097	964,292	127,413	343,596	19,045	7,185	4,983
34	33	Alabama Gas Corp.[C]	352,464	82,838	311,477	4,829	113,870	8,577	6,142	7,004
35	34	Southwest Gas Corp.	346,138	114,698	432,341	9,571	310,257	28,064	3,297[E]	8,450[F]
35	35	Arizona Public Service Co.	341,184	41,284	882,154	197,434	3,688,270[D]	558,453[D]	6,180	3,904
20	36	Southern Union Gas Co.	339,700	52,566	199,837	2,087	121,766	14,196	6,222	2,563
39	37	Indiana Gas Co. Inc.	309,976	89,092	307,693	11,524	294,987	22,524	6,221	4,512
38	38	The Cincinnati Gas & Electric Co.	301,857	88,820	1,002,053	102,458	191,820	14,559	3,446	820
41	39	Philadelphia Electric Co.	293,042	72,918	356,431	23,129	371,207	40,015[D]	4,335	3,071
40	40	Peoples Natural Gas Div., N NG	292,069	152,309	476,536	6,692	138,282	7,736	9,773	3,426
42	41	Energas (Pioneer Corp.)	280,350	233,362	689,691	44,746	101,075	4,974	4,262	10,625
—	42	Gas Co. of New Mexico	278,164	71,098	304,254	2,592	140,964[H]	12,186	6,296	1,396
43	43	Northern States Power Co.	276,377	67,734	271,995	N/A	247,330	21,965	4,200	2,920
45	44	San Antonio City Public Service	265,433	25,550	105,013	48,234	146,015	8,263	3,402	2,981
44	45	Dayton Power & Light Co.	264,874	56,461	772,274	93,990	82,824	7,122	3,803	737
46	46	Equitable Gas Co.	258,441	78,148	337,665	39,803	420,995	34,978	3,342	N/A
48	47	Northwest Natural Gas Co.	252,800	74,590	358,171	16,885	283,751	28,979	7,700	4,240
47	48	Washington Natural Gas Co.[C]	249,219	59,057	313,314	10,734	293,827	23,791	5,915	5,842
49	49	Louisville Gas & Electric Co.	233,226	54,326	177,256	5,850[D]	87,544	—	926	2,221
50	50	Louisiana Gas Service Co.[C]	232,455	21,833	91,486	3,697	63,655	6,961	3,584	2,259
52	51	Memphis Gas Light & Water	230,770	64,041	202,171	-0-	155,449	7,600[E]	3,047	2,310
54	52	New Jersey Natural Gas Co.	228,118	46,912	203,255	5,510	177,385	16,827	4,317	3,772
56	53	Rochester Gas & Electric Corp.	227,953	45,828	610,102[D]	65,313	194,108	9,790	3,541	2,770
53	54	Iowa Illinois Gas & Electric Co.	223,894	61,071	227,495	47,200[D]	180,847	9,843	3,614	2,591
55	55	Bay State Gas Co.	219,802	43,068	263,877	7,278	219,099	12,544	2,324[E]	2,093[E]

The P&GJ 500 ... dimensions of the pipeline energy business

Rank '81	Rank '82	Name of Company	Number of Customers	1981 Gas Sales MMcf	1981 Oper. Revenues $/000	1981 Net Income $/000	Gas plant value /000 12-31-81	Additions to plant $/000	Miles of Mains	Miles of Services
58	56	Wisconsin Natural Gas Co.	215,523	67,811	284,943	3,858	208,894[H]	13,249	4,190	2,812
59	57	Kansas-Nebraska Nat. Gas Co. Inc.	210,900	91,907	452,992	25,574	487,396	45,099	3,636	600
60	58	Citizens Gas & Coke Utility	209,115	62,532	193,197	4,226	228,249	19,081	3,247	4,145
61	59	UGI Corp.	205,437	66,066	293,080	31,965	196,415	24,256	3,243	2,020[I]
57	60	Mississippi Valley Gas Co.[C]	202,471	57,196	183,923	5,319	95,948	6,151	4,299	2,165[I]
73	61	Commonwealth Gas Co.	198,486	39,433	202,701	3,306	100,020	33,263	3,473	1,546
63	62	Piedmont Natural Gas Co.	196,472	66,324	307,308	10,038	212,410	24,646	3,351[I]	1,871[I]
62	63	Elizabethtown Gas Co.[I]	193,445	41,511	221,251	7,953	102,595	11,273	6,730	1,430
65	64	Central Illinois Light Co.[A]	183,477	48,453	140,639	29,695	183,806	17,658	3,157	2,743
72	65	Central Illinois Public Service Co.	183,397	45,275	157,953	N/A	197,350	10,375	3,180	2,777
67	66	New Orleans Public Service Inc.	175,388	29,135	98,660	10,358	74,021	2,335	1,423	1,097
66	67	Peoples Gas System Inc. (Tampa)	169,261	41,541	145,387	8,443	137,793	9,313	4,152	1,884
69	68	Montana-Dakota Utilities Co.	170,234	43,785	145,784	4,916	239,500	30,262	7,232	1,599[I]
68	69	South Carolina Electric & Gas Co.	169,294	48,180	750,687[D]	82,867[D]	151,866	8,154	4,278	3,531
70	70	Northeast Utilities	152,118	29,011	207,956	N/A	N/A	N/A	2,150[I]	1,611[I]
71	71	Wisconsin Public Service Corp.	151,898	48,048	492,262	39,082	104,000	2,643	2,744	2,019
74	72	Public Service Co. of N.C. Inc.	147,534	11,647	210,576	8,996	117,554	14,374	1,959[I]	1,405[I]
75	73	Western Kentucky Gas Co.	138,678	39,114	124,132	2,091	80,828	4,837	1,835[I]	1,320[I]
76	74	Long Beach Gas Dept.	135,000[I]	27,640	126,650	14,137	22,000	—	800[I]	800[I]
—	75	Iowa Power & Light Co.	133,263	29,601	328,261	31,126	118,226	24,905	2,019	2,061
77	76	The Kansas Power & Light Co.	132,618	41,914	106,499	2,672	53,220	2,459	4,250	623
78	77	The Southern Connecticut Gas Co.	131,825	20,277	131,085	6,897	125,950[H]	9,534	1,778	2,001
79	78	Iowa Electric Light & Power Co.	131,285	35,980	345,590	24,430	61,180	3,253	2,107	1,960
80	79	New York State Electric & Gas Corp.	129,437	38,896	158,361	107,801	94,014	5,027	3,632[I]	1,233[I]
64	80	South Jersey Gas Co.	129,268	40,620	218,106	7,949	114,014	17,614	3,393	2,358
81	81	Metropolitan Util. District (Omaha)	128,871	29,353	94,644	(335)	102,437	3,923	1,702	1,938
82	82	Iowa Public Service Co.	122,328	39,195	325,793	31,412	72,343	3,872	1,860	1,669
85	83	Connecticut Natural Gas Co.	121,999	25,440	142,720	6,142	128,860	12,887	404[I]	1,161[I]
83	84	Virginia Electric & Power Co.	121,471	19,738	92,089	N/A	75,949	9,660	2,123	2,320
84	85	Providence Gas Co.	117,637	22,040	121,999	3,543	61,766	6,619	1,677	1,193
88	86	Penn Gas & Water Co.	112,464	34,531	149,966[I]	7,466	138,070	14,152	903	1,238[I]
90	87	Michigan Energy Resources Co.	104,840	34,643	138,681	3,008	110,179	7,576	2,259	2,337
91	88	Montana Power Co.	102,875	28,591	152,476	62,046[D]	180,093[H]	575	1,793	1,943
92	89	Wisconsin Power & Light	102,290	25,695	115,221	40,727[D]	93,077	7,463	2,114	775[I]
93	90	North Shore Gas Co.[C]	97,413	33,660	138,072	5,485	106,837	3,672	1,600	1,498
—	91	Midwest Natural Gas Corp.	95,403	18,042	5,819	—	—	—	118	122
94	92	City Gas Co. of Florida	94,330	10,732	45,095	2,104	41,980	3,038	1,767	984
95	93	Intermountain Gas Co.	92,703	31,747	142,331	2,246	111,347	3,647	2,998	1,757
96	94	Orange and Rockland Utilities	88,333	25,026	109,820	30,372[D]	87,605	7,950	1,439	1,169
97	95	Colonial Gas Co.	88,321	15,036	97,021	3,265	81,224	6,013	1,975	919[E]
—	96	Mobile Gas Service Co.[C]	86,832	15,511	51,427	3,109	31,264	3,690	1,221	1,578
98	97	Gulf States Utilities Co.	85,395	8,600	37,568	1,645	16,720	895	1,329	1,175
101	98	Colorado Springs Dept. Pub. Util.	84,497	16,344	64,388	(2,145)	39,356	4,330	1,261	878[E]
100	99	North Carolina Natural Gas Corp.	83,124	43,422	179,678	4,404	53,126	6,396	1,065[E]	791[E]
99	100	Cascade Natural Gas Corp.	82,596	38,499	191,226	4,168	143,400	13,437	2,808	1,382

The P&GJ 500 ... dimensions of the pipeline energy business

Rank '81	Rank '82	Name of Company	Number of Customers	1981 Gas Sales, MMcf	1981 Oper Revenues $ (000)	1981 Net Income $ (000)	Gas plant value (000) 12-31-81	Additions to plant $ (000)	Miles of Mains	Miles of Services
102	101	Washington Water Power Co.	75,408	27,820	120,999	1,167[D]	59,587	2,610	1,447	718
103	102	Delmarva Power & Light Co.	74,016	16,520	83,070	58,711[D]	66,031	2,311	95	866
104	103	Arkansas Western Gas Co.	70,381	16,400	48,600	2,300	55,281	3,500	1,409[E]	670[E]
107	104	City of Richmond, VA	69,671	14,059	59,600	2,864	33,275	20	317[E]	663[E]
—	105	Michigan Power Co.	67,865	22,059	84,717	1,620	44,270	2,876	881[E]	646[E]
109	106	Nashville Gas Co.	67,819	19,643	68,086	904	50,864	2,419	755[E]	646[E]
106	107	Madison Gas and Electric Co.	67,727	14,977	162,082[D]	12,583[D]	62,166	5,926	1,248	941
108	108	TransLouisiana Gas Co. Inc.	67,608	35,979	135,290	2,789	32,911	3,916	1,037[E]	644[E]
118	109	United Cities Gas Co.	67,269	16,173	64,599	2,047	53,503	4,646	1,764	1,142
112	110	Southeastern Michigan Gas Co.	65,901	15,050	56,253	978	75,036	9,730	1,433	986
114	111	Associated Natural Gas Co.	65,464	11,268	41,107	873	21,482	2,107	727[E]	623[E]
116	112	Greeley Gas Co.	65,364	11,372	42,445	(500)	15,419	1,699	1,454	750
111	113	Rio Grande Valley Gas Co.	65,096	6,368	31,098	1,980	30,611	2,751	517[E]	619[E]
113	114	Northwestern Public Service Co.	64,377	13,023	40,799	17,587	29,142	1,731	448[E]	613[E]
87	115	Gasco Inc.	64,300	4,890	74,600	2,600	52,100	1,400	587	531
115	116	Southern Indiana Gas & Electric Co.	62,583	19,142	57,434	20,145[D]	33,077	2,164	1,007	873
—	117	The Union Light Heat & Power Co.	60,827	13,273	137,558	1,987	51,678	3,365	720	162
120	118	City of Corpus Christi Gas Div.	57,010	5,281	21,722	N/A	N/A	N/A	447[E]	543[E]
119	119	North Central Public Service Co.	55,000[E]	26,000[E]	100,000[E]	250[E]	20,000[E]	2,000[E]	889	260
123	120	Union Gas System Inc.	53,973	13,869	35,423	274	10,992	N/A	2,810	23
124	121	Arkansas Oklahoma Gas Corp.	53,957	12,084	31,470	1,332	36,821	4,047	1,852	409
128	122	Gas Light Co. of Columbus	53,761	10,189	37,079	434	24,276	1,197	157	512
122	123	City Utilities of Springfield	53,678	10,729	34,902	1,854[D]	28,515	271	772	870
125	124	Sierra Pacific Power Co.	53,180	6,424	269,784	25,685	31,541	3,033	603[E]	430[E]
126	125	CP National Corp.	52,440	8,226	46,612	1,368	43,295	2,146	811[E]	499[E]
131	126	Missouri Utilities Co.	48,154	7,230	25,983	1,600[E]	23,035	1,600	376[E]	458[E]
134	127	Central Hudson Gas & Electric Corp.	46,285	9,480	46,489	29,679[D]	55,642	2,276	694	445
133	128	Valley Resources Inc.[C]	45,844	6,621	39,039	1,463	21,025	1,877	486	333
—	129	Northwest Natural Gas Co.[A]	45,605	7,242	33,561	UNK.	UNK.	UNK.	214	3,635
135	130	Interstate Power Co.	44,949	25,375	75,151	169	26,270	2,343	403[E]	428[E]
132	131	Energy Services of Pensacola	42,092	4,744	21,953	5,080	N/A	472	928	649
137	132	Fall River Gas Co.	40,865	6,127	38,449	N/A	N/A	N/A	439	425
139	133	Florida Public Utilities Co.	40,844	6,968	25,837	1,363	17,715	N/A	573	N/A
136	134	Missouri Public Service Co.	40,665	10,529	27,301	N/A	N/A	N/A	680	486
141	135	Iowa Southern Utilities Co.	37,968	9,026	35,180	298	14,139	774	658	558
142	136	Wisconsin Fuel & Light Co.	37,447	14,647	57,435	623	13,024	2,178	515[E]	357[E]
143	137	Wisconsin Southern Gas Co. Inc.	37,077	7,970	31,273	462	25,642	1,495	995	606
144	138	Missouri Power & Light	35,065	6,954	25,313	1,272	22,329	1,391	689	445
145	139	Terre Haute Gas Co.	32,380	16,694	43,623	N/A	N/A	N/A	465[E]	308[E]
149	140	Roanoke Gas Co.	31,485	7,689	34,114	1,329	22,397	1,033	413[E]	300[E]
148	141	Battle Creek Gas Co.	30,960	12,050	41,088	2,045	29,445	1,627	507	50
146	142	Southeast Alabama Gas District	30,815	8,478	32,300	3,725	25,513	981	944[E]	293[E]
150	143	North Penn Gas Co.[A]	30,356	UNK.	UNK.	UNK.	UNK.	UNK.	607	1,499
151	144	Haverhill Gas Co.	29,285	4,519	27,860	1,001	21,029	3,005	283[E]	279[E]
159	145	Chattanooga Gas Co.	29,195	24,016	85,411	1,732	38,198	1,579	557[E]	278[E]

The P&GJ 500 ... dimensions of the pipeline energy business

Rank '81	Rank '82	Name of Company	Number of Customers	1981 Gas Sales, MMcf	1981 Oper. Revenues $ (000)	1981 Net Income $ (000)	Gas plant value (000) 12-31-81	Additions to plant $ (000)	Miles of Mains	Miles of Services
171	146	Delta Natural Gas Co.	28,003	6,847	22,680	190	13,386	2,134	442[E]	267[E]
152	147	City of Salem[A]	28,000[E]	880	1,400	—	—	—	50[E]	100[E]
162	148	Berkshire Gas Co.	27,393	5,551	28,083	1,163	21,754	2,956	562	320
153	149	Penn Fuel Gas Co.	27,375	17,232	44,898	N/A	N/A	N/A	285[E]	N/A
154	150	Kokomo Gas & Fuel Co.[A]	27,231	UNK.	UNK.	UNK.	UNK.	UNK.	118	698
155	151	Portsmouth Gas Co.[A]	26,342	UNK.	UNK.	UNK.	UNK.	UNK.	513	505
157	152	Ohio Gas Co.	25,140	6,700	27,016	1,314	28,072	1,556	504	408
161	153	Ohio Valley Gas Corp.[A]	24,092	7,251	21,541	—	—	—	46	558
158	154	City of Alexandria Gas Dept.[A]	23,250	3,078	7,242	—	—	—	57	—
163	155	Cheyenne Light Fuel & Power Co.[A]	23,251	15,984	32,617	619	10,216	716	399	N/A
165	156	City of Palo Alto Utilities[B]	22,989	2,966	13,061	234	3,939	304	204	215
166	157	City of Mesa, Ariz.	22,499	2,197	9,936	720	11,282	1,012	520	277
168	158	Great Falls Gas Co.	22,324	4,486	19,407	75	9,851	501	267[E]	416[E]
167	159	City of Hamilton	22,176	4,500	16,312	96	4,671	1,353	210	N/A
169	160	Willmut Gas & Oil Co.[A]	21,259	3,756	14,561	—	—	—	475	390
170	161	City of Duluth Dept. of Water & Gas	21,215	4,880	19,108	507	21,392	3,486	204[E]	202[E]
174	162	Rocky Mountain Natural Gas Co. Inc.	20,672	3,723	19,651	134	22,824	1,934	404	379
173	163	Nebraska Natural Gas Co.[A]	20,447	6,894	16,205	—	—	—	—	—
177	164	Austell Natural Gas System	20,320	3,860	15,471	—	14,762	407	482	423
172	165	City of Albany Water, Gas & Light[A]	20,271	4,851	11,000	—	—	—	340	—
176	166	Brazos River Gas Co.[C]	19,869	2,714	10,864	(78)	4,212	171	521	37
179	167	Knoxville Utilities Board	19,304	7,133	24,670	—	—	—	643	376
183	168	Inter-City Gas Corp. Inc.[A]	19,059	15,750	56,367	—	—	—	66	513
181	169	Kansas Public Service Co.	18,075	9,654	—	—	—	—	—	253
187	170	Northern Indiana Fuel & Light Co. Inc.	18,006	5,123	18,922	881	16,099	821	468	N/A
182	171	Great River Gas Co.[A]	17,795	5,838	19,168	—	—	—	275[E]	169[E]
184	172	Union Electric Co.	17,300	2,694	11,727	531	13,694	678	95[E]	164[E]
—	173	Gulf Natural Gas Corp.	17,210	—	—	—	—	—	—	426
191	174	Pennsylvania & Southern Gas Co.[A]	17,055	5,580	20,342	—	—	—	423	221
—	175	Okaloosa County Gas District[A]	17,038	2,372	8,608	—	—	—	353	476
—	176	South Coast Gas Co.[A]	16,500[E]	1,300[E]	—	—	—	—	53	157
—	177	Jackson Utility Division[A]	15,897	5,173	11,478	—	—	—	212	151
—	178	National Oil & Gas Corp.	15,742	14,346	46,251	3,833	24,061[H]	2,940	1,024	137
190	179	Manchester Gas Co.	15,709	1,861	13,422	286	12,360	—	194	178
189	180	Citizens Utilities Co.[A]	15,430	3,186	10,877	—	—	—	447	81
192	181	Northern Gas Co.[A]	15,045	3,125	10,660	—	—	—	42	274
193	182	City of Danville Gas Department[B]	14,804	5,605	20,802	1,557	5,147	451	242	175
196	183	Fitchburg Gas & Electric Co.	14,767	2,819	48,138[D]	2,590[D]	14,229	254	145[E]	141[E]
203	184	City of Las Cruces[A]	14,657	1,554	5,827	—	—	—	302	45
193	185	City of Danville Water, Gas & Electric[A]	14,648	5,425	14,304	—	—	—	218	174
195	186	Rio Grande Natural Gas Assoc.[A]	14,500	2,500[E]	1,200[E]	—	—	—	252	138
198	187	Moran Utilities Co.[A]	14,060	1,473	10,691	—	—	—	96	287
205	188	Houma Municipal Gas System[A]	14,013	3,846	—	—	—	—	339	156
194	189	Trussville Utilities Board	13,799	1,981	10,490	1,732	16,831	115	169[E]	131[E]
—	190	Cheasapeake Utilities Corp.[A]	13,431	1,829	8,858	—	—	—	177	128

The P&GJ 500 ... dimensions of the pipeline energy business

Rank '81	Rank '82	Name of Company	Number of Customers	1981 Gas Sales, MMcf	1981 Oper. Revenues ($1000)	1981 Net Income ($1000)	Gas plant value (1000) 12-31-81	Additions to plant ($1000)	Miles of Mains	Miles of Services
201	191	Great Plains Natural Gas Co.[A]	13,107	3,712	13,721	—	—	—	65	302
—	192	Tennessee-Virginia Energy Corp.[A]	12,905	8,494	26,838	—	—	—	443	123
—	193	Gainesville Gas Co.[A]	12,885	293	—	—	—	—	292	277
204	194	Lancaster Municipal Gas Co.	12,664	2,103	1,138	9,137	N/A	—	161[E]	121[E]
210	195	Vermont Gas Systems Inc.[A]	12,161	3,991	22,261	—	—	—	136	115
213	196	Charlottesville Gas Division	11,830	2,370	10,000	—	—	—	163	135
207	197	City of Warner Robbins Gas[A]	11,789	5,643	6,858	—	—	—	18	190
208	198	Corning Natural Gas Corp.	11,745	12,501	40,154	402	7,453	187	317	N/A
212	199	Hobbs Gas Co.[A]	11,087	1,503	5,819	—	—	—	25	242
211	200	Dalton Utilities[A]	11,000	9,617	—	—	—	—	40	—
217	201	Lake Superior District Power Co.	10,628	5,541	17,512	1,776	4,536	87	229	141
215	202	Mid. Ten. Gas Utility District[A]	10,469	2,880	10,000[E]	—	—	—	310	576
216	203	Citizens Gas Fuel Co.	9,990	2,827	12,966	1,114	8,427	783	225	N/A
218	204	Union Gas Co.[A]	9,751	5,260	14,261	—	—	—	232	93
225	205	Midwest Energy Inc.	9,650	1,952	5,144	(202)	3,750	266	171	N/A
—	206	Northeast Oklahoma Public Utilities[A]	9,625	—	—	—	—	—	316	92
219	207	Hastings Utilities	9,616	242	5,508	545	—	—	140	100
230	208	Greenwood Public Works[A]	9,581	2827	12,044	1,287	6,782	389	286	160
—	209	Marshall County Gas District[A]	9,453	—	—	—	—	—	224	90
220	210	Southern Public Service Co.	9,416	1,467	6,090	167	3,237	266	150	100
224	211	Lynchburg Gas Co.[A]	9,414	4,942	16,812	—	—	—	175	339
233	212	City of Rocky Mount	9,412	2,261	—	—	10,800	370	139	96
288	213	Illinois Gas Co.[A]	9,360	1,569	—	—	—	—	248	55
222	214	Austin Utilities	9,179	2,567	8,637	478	1,666	104	55[E]	87[E]
223	215	City of Florence Gas Department[A]	9,164	1,524	4,430	—	—	—	362	200
226	216	City of Pleasant Grove	9,043	872	4,799	713	500	0	179	91
228	217	Superior Water, Light & Power Co.	8,979	2,455	9,555	278	6,664	361	145	138
229	218	Cedar Falls Utilities	8,968	1,451	5,854	652	3,417	299	132	73
235	219	City of LaGrange Gas Dept.[A]	8,570	2,000[E]	2,500[E]	—	—	—	140	100
231	220	Vicksburg Water and Gas[A]	8,373	1,175	5,248	813	1,800	475	32	80
232	221	North Carolina Gas Service[A]	8,333	1,175	5,248	813	1,800	475	32	80
248	222	Norco Gas & Fuel Co. Inc.	8,188	1,030	4,209	79	2,306	533	189	33[E]
239	223	City of Tallahassee Muni. Gas	7,322	1,378	6,128	282	—	—	234	190
237	224	City of Norwich Public Utilities	7,203	1,030	6,702	604	5,446	248	106	
236	225	Orangeburg Dept. of Public Utilities[A]	7,413	3,406	11,144	—	—	—	125	71
—	226	SW Texas Municipal Gas Corp.[A]	7,358	268	—	—	—	—	163	70
239	227	Clinton-Newberry Gas Auth.[A]	7,170	2,061	—	—	—	—	105	400
240	228	Owatonna Public Utilities	7,084	2,929	8,735	939	2,419	161	115	N/A
241	229	Graysville Municipal Gas System	7,000	578	3,163	700	2,120	0	140	30
242	230	Schagrin Gas Co.[A]	7,000	—	—	—	—	—	—	—
244	231	City of Dyersburg Gas System[A]	6,863	1,340	—	—	—	—	195	65
245	232	City of Del Rio Gas System[A]	6,815	480	1,671	—	—	—	157	—
246	233	Phoenix Department of Utilities[A]	6,651	1,393	1,086	—	—	—	77	63
—	234	Peoples Natural Gas of SC	6,295	3,530	14,811	399	4,074	840	197	190
258	235	Lake Apopka Natural Gas District	6,286	1,183	4,578	—	2,515	380	273	125

The P&GJ 500 ... dimensions of the pipeline energy business

Rank '81	Rank '82	Name of Company	Number of Customers	1981 Gas Sales, MMcf	1981 Oper. Revenues $ (000)	1981 Net Income $ (000)	Gas plant value (000) 12-31-81	Additions to plant $ (000)	Miles of Mains	Miles of Services
251	236	Missouri Edison Co.	6,281	3,159	46,066[D]	2,263[D]	6,061	284	304	144
249	237	Dixie Gas Co. Inc.	6,280	545	2,358	117	1,820	20	184	30[E]
247	238	Westfield Gas & Electric Light	6,259	1,036	5,684	382	4,064	309	123	67
250	239	Liberal Gas Co.[A]	6,200	1.3	2,000	—	—	—	105	4
254	240	City of Fultondale, Gas Board[A]	6,057	577	281	—	—	—	144	60
252	241	Gibson County Utility District[A]	6,052	106	—	—	—	—	128	175
253	242	City of Wilson	6,025	873	4,262	330	2,337	296	144	57[E]
257	243	Consumers Gas Utility Co.[A]	5,954	1,019	3,490	—	—	—	266	62
—	244	City of Leesburg	5,901	716	2,843	567	1,805	N/A	121	102
256	245	Allied Gas Co.[A]	5,895	2,261	6,386	—	—	—	—	—
—	246	Gas Utilities Co.[A]	5,892	—	17,314	—	—	—	110	40
266	247	Shenandoah Gas Co.	5,806	4,181	15,675	67	10,843	1,022	224	85
262	248	City of Cartersville Gas Dept.[A]	5,720	2,250	1,856	—	—	—	89	54
259	249	Concord Natural Gas[A]	5,684	1,070	4,572	—	—	—	146	75
263	250	Bay City Gas Co.[A]	5,620	852	900	—	—	—	—	168
272	251	Watertown Gas Department	5,605	1,102	3,736	243	2,520	180	116	104
—	252	City of Vidolia[A]	5,600	191	156	—	—	—	30	53
265	253	Consumers Gas Co.[A]	5,598	1,165	3,657	—	—	—	158	102
260	254	Cullman-Jefferson Counties Gas District[A]	5,573	1,680	4,067	—	—	—	60	350
274	255	City of Sylacauga Utility Board[A]	5,531	1,390	3,581	—	—	—	472	575
261	256	The Polaris Corp.[A]	5,453	452	1,758	—	—	—	68	106
278	257	NW Alabama Gas District	5,353	5,080	18,496	2,172	15,398	1,420	403	184
270	258	The Toledo Edison Co.	5,319	1,432	4,690	244	5,254	451	106	82
264	259	Elizabethtown Natural Gas	5,298	1,347	4,386	724	1,000	—	30	130
268	260	City of Thibodaux	5,207	804	3,771	265	2,661	1,234	35[E]	50[E]
271	261	Natural Gas Distributing Co.[A]	5,197	968	2,000	—	—	—	92	16
—	262	Pike Natural Gas Co.	5,094	1,051	4,393	168	3,489	314	152	5
267	263	City of Moss Point Utilities[A]	5,090	352	479	—	—	—	95	—
281	264	Bristol-Warren Gas Co.	5,068	507	3,652	N/A	3,049	132	75	38
273	265	City of Milton Natural Gas[A]	5,000	—	1,200	—	—	—	47	43
275	266	South Penn Gas Co.[A]	4,929	2,529	6,929	—	—	—	—	—
276	267	New Ulm Public Utilities	4,915	1,741	5,713	156	1,752	39	71	N/A
279	268	City of Chanute[A]	4,822	1	—	—	—	—	38	46
277	269	Decatur Utilities	4,803	5,971	20,277	899	6,542	274	163	85
281	270	City of Fairhope Gas Dept.[A]	4,781	482	1,156	—	—	—	85	262
283	271	St. Joseph Light & Power[A]	4,695	1,224	4,543	—	—	—	52	121
286	272	City of Thomasville Water & Light[A]	4,663	859	2,561	—	—	—	97	44
284	273	Eastern Illinois Gas & Securities[A]	4,626	1,102	—	—	—	—	23	132
285	274	Oak Ridge Utility District[A]	4,594	822	1,750	—	—	—	84	44
289	275	City of Lexington, Gas Dept.	4,531	2,336	9,458	N/A	N/A	0	143	76
290	276	City of Winfield[A]	4,455	808	2,096	—	—	—	78	23
291	277	Petrolane Wyoming Gas Service[A]	4,454	925	—	—	—	—	87	—
295	278	West Tennessee Public Utility District[A]	4,415	1,829	4,896	—	—	—	314	30
292	279	Clarksville Gas Department[A]	4,379	2,826	6,755	—	—	—	164	111
293	280	Westlake Gas Department	4,376	293	1,234	193	905	42	84	45

The P&GJ 500 ... dimensions of the pipeline energy business

Rank '81	Rank '82	Name of Company	Number of Customers	1981 Gas Sales MMcf	1981 Oper. Revenues $(000)	1981 Net Income $(000)	Gas plant value (000) 12-31-81	Additions to plant $(000)	Miles of Mains	Miles of Services
297	281	Cody Gas Co.	4,269	1,847	4,912	86	4,555	372	297	N/A
—	282	Indiana Natural Gas Corp.[A]	4,240	909	2,998	175	2,250	114	145	—
—	283	City of Shelby Gas Department[A]	4,211	3,204	9,268	—	—	—	77	109
296	284	City of Dumas[A]	4,200	447	—	—	—	—	5	71
299	285	Bluefield Gas Co.[A]	4,140	1,192	4,050	—	—	—	87	20
—	286	Nebraska City Utilities[A]	4,067	912	3,057	—	—	—	—	—
298	287	Syracuse Suburban Gas Co. Inc.	4,063	4,637	17,030	151	3,864	480	80	N/A
300	288	Borough of Chambersburg Gas[A]	4,052	928	3,268	—	—	—	54	50
—	289	City of Corinth Gas & Water[A]	4,040	636	706	—	—	—	5	73
—	290	City of Deming Gas System[A]	4,011	497	—	—	—	—	38	30
—	291	Lawrenceburg Gas Co.[A]	3,841	2,977	UNK.	UNK.	UNK.	UNK.	111	14
—	292	Los Alamos County Utilities[A]	3,600	597	UNK.	UNK.	UNK.	UNK.	61	33
—	293	Las Vegas Natural Gas System[A]	3,494	1,046	UNK.	UNK.	UNK.	UNK.	101	31
—	294	Mt. Carmel Public Utility Co.[A]	3,442	576	UNK.	UNK.	UNK.	UNK.	36[D]	20[D]
—	295	Laurens Commission of Public Works[A]	3,410	1,885	UNK.	UNK.	UNK.	UNK.	75	32
—	296	Central Florida Gas Corp.[A]	3,361	5,544	UNK.	UNK.	UNK.	UNK.	271	118
—	297	Fultondale Water Works and Gas Board[A]	3,328	1,355	UNK.	UNK.	UNK.	UNK.	54	31
—	298	Monarch Gas Co.	3,050	576	1,157	UNK.	UNK.	UNK.	154	20
—	299	Linton Municipal Gas[A]	2,612	597	UNK.	UNK.	UNK.	UNK.	61	33
—	300	City of Monroe	2,338	919	UNK.	UNK.	UNK.	UNK.	79	45

The 100 Leading Gas Transmission Lines

Rank '81	Rank '82	Name of Company	MILES OF PIPELINES Total	Transmission	Field, Gath.	Storage	1981 Gas Sales, MMcf	1981 Oper. Revenues $(000)	1981 Net	Gas Plant Value (000) 12-31-81	Additions to plant 1981 (000)
1	1	Northern Natural Gas Co.	22,488	14,675	7,675	138	717,556	2,015,712	88,279	2,007,269	208,460
2	2	El Paso Natural Gas Co.	21,251	9,331	11,920	—	1,263,962	3,531,024	160,563	2,616,586	195,719
3	3	Columbia Gas Transmission Corp.	18,136	10,046	6,858	1,222	1,123,610	3,429,591	91,051	1,769,285	231,278
4	4	Tennessee Gas Pipeline Co.	13,788	13,755	31	2	1,138,605	3,276,649	154,440	1,303,185	221,076
7	5	Kansas-Nebraska Natural Gas Co., Inc.	12,970	10,091	2,856	23	124,788	452,992	25,574	487,396	45,099
5	6	Natural Gas Pipeline Co. of America	12,338	10,465	1,777	96	936,467	2,546,835	102,377	1,911,528	80,267
6	7	Panhandle Eastern Pipe Line Co.	12,252	6,814	5,329	109	706,225	1,942,047	188,963	1,257,454	110,937
8	8	Enserch (Lone Star Gas)	11,480	8,915	2,565	—	527,425	1,800,399	107,472	1,093,358	75,777
10	9	Michigan Wisconsin Pipe Line Co.	11,165	7,700	3,285	180	644,084	2,294,557	129,390	2,220,421	223,984
9	10	Pioneer Corporation	11,128	9,880	1,248	—	290,400	1,224,645	110,204	643,935	150,544
11	11	Transcontinental Gas Pipe Line Corp.	10,820	10,576	124	120	901,939	3,396,582	93,756	2,280,527	106,359
12	12	Cities Service Gas Co.	9,711	5,835	3,696	180	365,908	954,718	46,495	553,105	35,480
13	13	Texas Eastern Transmission Corp.	9,506	9,259	48	198	935,129	2,334,210	249,669	2,076,258	203,355
14	14	United Gas Pipe Line	9,503	7,356	2,120	28	1,062,438	3,252,103	112,444	942,052	123,699
15	15	Arkla, Inc.	9,194	6,136	3,015	43	330,147	976,069	87,560	987,446	89,620
16	16	Consolidated Gas Supply Corp.	8,187	3,565	4,104	518	559,566	1,855,238	75,125	596,454	15,793
17	17	Southern Natural Gas Co.	7,497	7,319	129	48	649,086	1,981,444	99,146	1,020,074	132,412
20	18	Northwest Pipeline Corp.	6,225	3,447	2,771	7	322,166	1,352,362	73,141	789,722	212,634
18	19	Colorado Interstate Gas Co.	6,068	2,725	3,109	234	323,328	1,013,060	69,066	629,879	42,128
19	20	Texas Gas Transmission Corp.	5,891	5,613	61	217	657,181	1,687,128	139,448	766,020	23,398
59	21	Valero Transmission Co.	5,316	4,043	1,273	—	621,137	2,144,242	52,999	419,505	44,188
27	22	National Fuel Gas Supply Corp.[C]	5,183	2,697	2,018	468	209,068	614,996	14,827	217,996	17,024
23	23	Pacific Gas & Electric Co.[A]	5,070	4,123	895	52	812,624	2,248,702	133,307	1,149,109	95,522
21	24	ONEOK, Inc.[A]	4,763	4,746	—	—	366,476	970,076	41,319	541,249	13,180
24	25	Florida Gas Transmission Co.	4,283	—	—	—	189,430	559,059	32,623	173,350	36,248

A. 1980 Data B. Fiscal year ending 7-31-81 C. Fiscal year ending 9-30-81 D. Intrastate pipeline

The P&GJ 500 ... dimensions of the pipeline energy business

Rank '81	Rank '82	Name of Company	MILES OF PIPELINES Total	Transmission	Field, Gath.	Storage	1981 Gas Sales, MMcf	1981 Oper. Revenues $(000)	1981 Net Income	Gas Plant Value (000) (Z-11-81)	Additions to plant 1981 (000)
—	26	Houston Natural Gas Corp.[D]	4,235	1,200	3,000	35	1,025,624	2,095,809	214,746	72,022	35,779
25	27	Columbia Gulf Transmission Co.	4,096	2,543	1,553	—	673,804	169,164	40,043	969,249	51,657
29	28	Montana-Dakota Utilities Co.	4,037	3,114	923	—	43,786	145,784	4,916	239,500	30,262
26	29	Transwestern Pipeline Co.	4,012	—	—	—	314,184	918,877	46,236	528,757	62,371
—	30	Public Service Co. of N.C., Inc.	3,971	—	—	—	44,368	210,577	8,997	117,554	14,374
22	31	Trunkline Gas Co.	3,915	—	—	—	524,400	1,545,104	57,971	899,062	70,253
32	32	Mitchell Energy & Development Corp.	2,900	—	—	—	114,574	1,064,844	115,217	130,476	39,757
28	33	The Montana Power Co.	2,784	1,804	926	54	40,919	362,486	62,046	262,803	31,763
—	34	North Carolina Natural Gas Corp.	2,695	839	1,856	—	43,422	179,678	4,404	79,970	6,396
30	35	Peoples Natural Gas	2,329	1,051	1,240	38	N/A	N/A	N/A	N/A	N/A
31	36	Michigan Consolidated Gas Co.	2,327	2,185	35	107	420,877	1,704,841	18,970	1,247,784	63,071
33	37	Mississippi River Trans. Corp.	2,209	1,969	167	73	189,333	606,986	37,226	309,397	40,405
34	38	Equitable Gas Company	2,096	476	1,492	128	91,060	337,656	39,804	420,995	34,789
35	39	Kentucky West Virginia Gas Co.	2,044	27	2,016	—	27,390	53,420	24,469	142,244	4,400
36	40	Western Slope Gas Company	2,030	1,563	447	20	48,719	158,579	906	90,898	9,732
—	41	Western Gas Pipeline Co.	1,989	1,174	801	14	99,081	244,444	1,227	114,929	13,251
37	42	Transok Pipe Line Co.	1,938	781	1,157	—	217,000	152,995	5,219	62,682	3,096
39	43	Mountain Fuel Supply Co.	1,929	1,303	616	9	115,038	354,640	18,771	550,427	59,757
38	44	Louisiana Intrastate Gas Corp.	1,874	1,874	—	—	203,617	844,854	59,168	243,624	21,267
40	45	Southwest Gas Corp.	1,607	1,607	—	—	114,968	432,391	9,571	310,257	28,064
41	46	National Fuel Gas Dist.	1,515	1,176	339	—	201,145	848,988	15,927	441,529	39,008
42	47	Central Illinois Public Service Co.	1,386	1,359	14	13	101,714	529,391	61,849	120,608	5,310
43	48	Consumers Power Co.[A]	1,276	1,114	22	140	340,762	986,350	65,427	1,195,295	61,429
44	49	Great Lakes Gas Transmission Co.	1,274	1,274	—	—	71,732	522,434	21,358	465,649	40,910
45	50	Carnegie Natural Gas Co.	1,170	256	914	—	24,880	73,134	4,554	65,294	4,760
48	51	Carolina Pipeline Co.[A]	1,017	1,017	—	—	34,452	105,448	6,555	44,841	1,090
47	52	East Tennessee Natural Gas Co.	1,012	1,012	—	—	81,825	243,988	7,185	59,654	2,132
58	53	Arkansas Oklahoma Gas Corp.	983	571	409	3	12,084	31,470	1,332	36,821	4,047
51	54	Arkansas Western Gas Co.	942	688	250	4	47,281	48,640	2,293	57,560	4,982
50	55	Midwestern Gas Transmission Co.	915	903	10	2	291,501	1,035,756	8,312	142,789	1,658
52	56	Algonquin Gas Transmission Co.	909	909	—	—	155,350	564,194	13,893	178,529	3,908
49	57	North Penn Gas Co.	891	587	291	13	21,340	74,839	1,079	33,345	1,692
53	58	Mid Louisiana Gas Co.	799	398	401	—	33,001	108,811	8,703	62,187	6,583
56	59	Pacific Gas Transmission Co.	799	799	—	—	258,458	1,317,827	31,180	366,037	173,132
54	60	South Georgia Natural Gas Co.	767	767	—	—	32,878	120,287	12,011	18,900	643
55	61	Michigan Gas Storage Co.	716	568	—	148	98,467	246,911	2,282	52,092	688
57	62	Associated Natural Gas Co.	602	602	—	—	11,268	41,107	873	35,887	2,227
59	63	Valero Interstate Trans. Co.	564	320	244	—	19,903	41,342	339	23,124	3,246
—	64	Channel Industries Gas Co.	551	551	—	—	129,586	436,953	4,590	41,800	7,020
60	65	Inland Gas Co., Inc.	531	94	437	—	10,596	30,150	2,698	22,311	1,494
—	66	Commonwealth Gas Pipeline Corp.	529	529	—	—	68,139	229,848	3,576	40,384	785
63	67	Tejas Gas Corp.	519	519	—	—	58,140	101,418	8,141	37,000	13,500
61	68	Northern Utilities, Inc.	502	456	46	—	10,854	41,765	955	24,237	1,777
62	69	Ohio Valley Gas Corp.[A]	482	152	330	—	6,458	19,006	506	11,748	925
64	70	Sea Robin Pipeline Co.	430	430	—	—	257,887	503,941	7,701	237,657	11,411

The P&GJ 500 ... dimensions of the pipeline energy business

Rank 81	Rank 82	Name of Company	MILES OF PIPELINES Total	Transmission	Field, Gath.	Storage	1981 Gas Sales, MMcf	1981 Oper. Revenues $,000	1981 Net Income	Gas Plant Value ,000 12-31-81	Additions to plant 1981 ,000
65	71	Washington Gas Light Co.	371	371	—	—	107,444	530,829	19,247	616,380	61,164
—	72	Mountain Fuel Resources	365	123	212	30	4,684	18,499	3,241	52,942	5,196
—	73	Pacific Interstate Trans. Co.	351	351	—	—	9,146	78,741	4,186	56,557	56,557
67	74	Stingray Pipeline Co.	325	325	—	—	N/A	46,774	9,747	234,776	1,170
68	75	Alabama-Tennessee Natural Gas Co.	315	314	1	—	35,469	116,805	5,786	17,689	645
69	76	Louisville Gas & Electric Co.[A]	306	178	—	128	58,307	443,893	42,173	132,989	4,973
70	77	Northern Gas Company	303	230	61	12	7,404	28,172	(873)	9,864	1,360
72	78	Western Gas Interstate Co.	295	243	52	—	5,035	13,749	58	7,045	2,858
71	79	Ringwood Gathering Co.	294	26	268	—	12,123	22,108	251	10,366	1,308
—	80	Esperanza Transmission Co.	275	275	—	—	20,181	76,232	3,911	8,870	6,740
75	81	Eastern Shore Natural Gas Co.	247	247	—	—	8,528	38,326	2,298	7,336	255
74	82	South Jersey Gas Co.[A]	241	239	2	—	41,988	177,605	9,644	138,047	14,768
73	83	Delta Natural Gas Co., Inc.	241	174	67	—	6,317	24,723	270	15,732	4,415
77	84	Valley Gas Transmission Inc.	239	—	239	—	5,888	16,038	174	4,711	840
76	85	St. Lawrence Gas[A]	234	234	—	—	6,342	31,393	228	10,993	366
78	86	Alaska Pipeline Co.	225	218	7	—	31,706	N/A	N/A	N/A	N/A
79	87	High Island Offshore System	203	203	—	—	N/A	88,557	9,111	342,728	3,442
80	88	Consolidated Systems LNG Co.	200	200	—	—	N/A	25,137	228	269,002	379
81	89	Standard Pacific Gas Line Inc.	190	185	5	—	N/A	1,086	(332)	(11,912)	N/A
82	90	McCulloch Interstate Gas Corp.	187	187	—	—	4,194	10,650	298	9,418	119
83	91	Peoples Natural Gas Co. of S.C.[A]	183	183	—	—	N/A	9,980	321	5,210	681
84	92	Sabine Pipe Line Co.	174	174	—	—	N/A	1,622	221	19,115	N/A
85	93	Chandeleur Pipe Line Co.	161	161	—	—	N/A	1,129	(336)	15,984	N/A
86	94	San Diego Gas & Electric[A]	138	129	—	9	88,483	280,036	16,563	154,297	18,930
87	95	West Texas Gathering Co.	127	59	68	—	31,198	31,299	63	4,316	22
88	96	Gas Transport, Inc.	109	41	68	—	3,799	12,733	1,334	3,659	36
—	97	Tenngasco Gas Gathering Co.[D]	104	104	—	—	26,685	80,475	2,179	11,972	169
89	98	Columbia LNG Co.	88	88	—	—	N/A	20,863	(657)	202,558	273
91	99	Lone Star Gathering Co.	85	78	7	—	N/A	382	66	2,406	44
—	100	Louisiana-Nevada Transit Co.	—	—	—	—	—	—	—	—	—

The 100 Leading Liquid Pipelines

Rank 80	Rank 81	Name of Company	Bbl delivered out of system in 1981 Crude oil	Products	Total	1981 Financial ($000) Oper. Rev.	Net Income	Property Value ,000 12-31-81	Changes in Prop. Val., $,000	Miles of Lines Owned Operated Gath. Lines	Crude Trunk	Products Trunk	Total
1	1	ARCO Pipe Line Co.	505,848	147,577	653,425	848,121	242,814	2,397,830	20,378	1,807	2,673	3,738	8,218
2	2	Colonial Pipeline Co.	—	625,406	625,406	394,452	79,693	1,300,303	39,245	—	—	5,241	5,241
4	3	Shell Pipe Line Corp.	388,573	139,738	528,311	136,419	27,352	418,887	17,356	2,195	5,235	392	7,822
3	4	Exxon Pipeline Co.	466,227	53,830	520,057	802,164	287,975	2,189,881	21,974	1,928	4,858	2,357	9,143
6	5	Marathon Pipe Line Co.	298,798	195,468	494,267	91,140	39,799	328,285	18,219	1,057	1,542	1,379	3,978
5	6	Amoco Pipeline Co.	357,578	121,678	479,256	162,733	51,962	484,766	21,761	2,327	7,871	2,127	12,325
7	7	Gulf Pipeline Co.	249,246	203,738	452,984	77,592	18,483	268,699	31,106	1,981	1,160	2,039	4,180
8	8	Texas Pipe Line Co.	287,925	151,170	439,095	91,130	28,569	255,168	12,328	1,244	2,492	539	4,275
9	9	Lakehead Pipe Line Co.	406,771	—	406,771	133,283	30,577	440,280	(1,485)	—	2,601	—	2,601
10	10	Mobil Pipe Line Co.	242,832	90,524	333,357	139,546	51,257	278,749	4,915	4,379	5,145	2,296	11,820

E. Under construction in 1981 and test and check out, common carrier operations began Jan. 1, 1982.
F. Owns share of Alyeska (TAPS) system.
G. Does not include ownership interest in lines operated by other carriers.

The P&GJ 500 ... dimensions of the pipeline energy business

Rank '82	Rank '81	Name of Company	Bbl delivered out of system in 1981			1981 Financial ($000)		Property Value ($000) 12-31-81	Changes in Prop. Val., $000	Miles of Lines Owned Operated			
			Crude oil	Products	Total	Oper. Rev.	Net Income			Gath. Lines	Crude Trunk	Products Trunk	Total
11	11	Sohio Pipe Line Co.	263,106	46,780	309,887	1,155,294	312,593	3,276,082	19,320	1,072	802	130	2,004
12	12	Buckeye Pipeline Co.	10,621	250,932	261,554	97,161	31,372	339,680	19,082	—	131	3,421	3,552
13	13	Phillips Pipe Line Co.	87,253	164,690	251,943	104,499	17,028	322,820	2,584	1,099	1,956	2,642	5,697
14	14	Southern Pacific Pipe Lines, Inc.	—	226,870	226,870	63,750	21,876	142,897	3,561	—	—	2,511	2,511
15	15	Sun Pipe Line Co.	106,319	86,467	192,787	56,099	30,805	125,491	(8,856)	3,135	—	—	3,135
19	16	Chevron Pipe Line Co.	155,770	35,065	190,836	49,213	9,239	179,612	18,452	214	1,437	1,490	3,141
16	17	Continental Pipe Line Co.	136,897	45,950	182,847	54,216	21,448	154,618	10,261	4,041	1,480	1,805	7,326
21	18	Cities Service Pipe Line Co.	175,765	5,767	181,533	22,017	2,996	60,997	3,744	626	876	110	1,612
18	19	Williams Pipe Line Co.	8,436	165,253	173,689	139,250	29,286	437,403	(10,383)	—	82	8,062	8,144
17	20	Plantation Pipe Line Co.	—	168,024	168,024	80,732	13,373	283,948	1,392	—	—	3,154	3,154
20	21	Texas-New Mexico Pipe Line Co.	157,207	—	157,207	31,151	7,140	86,592	468	1,894	2,219	—	4,113
23	22	Mapco, Inc.	—	138,539	138,539	87,476	31,924	404,014	42,775	—	—	7,769	7,769
25	23	Texas Eastern Products P/L Co.	195	128,068	128,264	92,342	N/A	393,016	8,320	—	—	3,385	3,385
27	24	West Texas Gulf Pipe Line Co.	118,343	—	118,343	19,942	4,628	44,821	235	—	581	—	581
29	25	Four Corners Pipe Line Co.	87,218	15,753	102,971	37,732	9,863	121,390	27,090	295	1,115	24	1,434
34	26	Pure Transportation Co.	74,200	18,917	93,117	23,861	8,019	67,973	162	833	704	12	1,549
24	27	Chicap Pipe Line Co.	91,839	—	91,839	12,322	2,814	38,520	201	—	235	—	235
26	28	Ashland Pipe Line Co.	91,825	—	91,825	36,782	11,467	91,873	1,732	453	859	—	1,312
31	29	BP Pipelines, Inc.	91,451	—	91,451	583,841	251,659	1,588,839	7,220	—	818	—	818
33	30	Explorer Pipeline Co.	—	90,725	90,725	42,206	3,656	249,480	928	—	—	1,397	1,397
32	31	Wolverine Pipe Line Co.	—	81,423	81,423	21,392	4,422	70,825	392	—	—	620	620
35	32	Olympic Pipeline Co.	—	72,308	72,308	19,368	5,359	56,498	167	—	—	391	391
37	33	Lake Charles Pipe Line Co.	—	71,773	71,773	2,779	(35)	10,329	538	—	—	13	13
30	34	Texaco-Cities Service P/L Co.	66,420	2,778	69,208	8,955	2,334	64,356	13,109	—	581	106	687
41	35	Portland Pipe Line Corp.	64,513	—	64,513	17,670	3,546	53,076	324	—	513	—	513
38	36	Owensboro-Ashland Co.	60,004	—	60,004	9,627	1,377	43,511	670	—	295	—	295
44	37	Seaway Pipeline, Inc.	59,161	—	59,161	17,487	(15,092)	209,007	97	—	515	—	515
36	38	Southcap Pipe Line Co.	57,913	—	57,913	15,899	2,739	53,345	275	—	—	—	—
28	39	Texoma Pipe Line Co.	57,066	—	57,066	23,418	101	140,145	4,392	—	504	—	504
39	40	Badger Pipe Line Co.	—	55,030	55,030	9,973	1,746	24,003	1,010	—	—	328	328
42	41	West Shore Pipe Line Co.	—	54,295	54,295	12,437	2,849	32,509	294	—	—	323	323
47	42	Platte Pipe Line Co.	49,811	—	49,811	21,357	5,606	70,255	416	—	1,280	—	1,280
66	43	Total Pipeline Corp.	34,724	12,444	47,168	7,924	1,256	22,976	791	231	436	64	731
48	44	Santa Fe Pipeline Co.	—	44,983	44,983	32,024	4,491	47,811	321	—	—	899	899
40	45	Amdel Pipeline Inc.	33,309	9,915	43,224	5,305	652	25,545	6,228	10	529	28	567
53	46	Minnesota Pipe Line Co.	42,638	—	42,638	11,200	2,346	28,586	—	—	365	—	365
55	47	Dixie Pipeline Co.	—	37,176	37,176	42,661	11,301	71,803	1,462	—	—	1,305	1,305
51	48	Kaneb Pipe Line Co.	—	37,176	37,176	19,864	4,988	65,486	20,835	—	—	1,458	1,458
45	49	Osage Pipe Line Co.	35,871	—	35,871	5,363	972	19,593	—	—	136	—	136
56	50	Hydrocarbon Transportation Inc.	—	35,690	35,690	34,486	6,863	127,442	2,780	—	—	1,514	1,514
50	51	Shamrock Pipeline Corp.	23,780	11,646	35,426	14,865	4,702	18,736	1,877	628	316	544	1,488
52	52	Dome Pipeline Corp.	—	35,347	35,347	6,804	8,193	21,913	163	1	8	129	138
43	53	Hess Pipeline Co.	34,111	—	34,111	8,464	1,457	50,117	14,508	—	356	—	356
57	54	Collins Pipeline Co.	—	33,793	33,793	3,548	882	14,311	14,727	—	—	124	124
49	55	Oiltanking of Texas P/L Co.	33,089	—	33,089	2,633	(155)	11,260	2,875	—	19	—	19

The P&GJ 500 ... dimensions of the pipeline energy business

Rank '80	Rank '81	Name of Company	Bbl delivered out of system in 1981			1981 Financial ($000)		Property Value ($000) 12-31-81	Changes in Prop. Val., $000	Miles of Lines Owned/Operated			
			Crude oil	Products	Total	Oper. Rev.	Net Income			Gath. Lines	Crude Trunk	Products Trunk	Total
46	56	Tecumseh Pipe Line Co.	32,680	—	32,680	2,150	521	15,247	86	—	206	—	206
58	57	Butte Pipe Line Co.	32,436	—	32,436	9,166	2,156	17,614	123	—	373	—	373
63	58	Wesco Pipe Line Co.	31,580	—	31,580	13,996	4,483	61,125	27,492	207	585	—	792
54	59	Laurel Pipe Line Co.	—	30,674	30,674	12,347	2,612	56,666	550	—	—	453	453
22	60	Mid-Valley Pipe Line Co.	30,212	—	30,212	46,642	8,873	113,847	717	—	1,099	—	1,099
59	61	Belle Fourche Pipe Line Co.	27,813	—	27,813	13,337	3,227	44,979	1,221	941	729	—	1,670
61	62	Jayhawk Pipeline Corp.	27,283	—	27,283	5,044	278	20,176	269	230	513	—	743
65	63	Cochin Pipeline System	—	26,753	26,753	62,278	34,230	240,987	—	—	—	1,200	1,200
60	64	Cook Inlet Pipe Line Co.	24,756	—	24,756	14,092	2,101	42,309	2	—	55	—	55
—	65	LOOP, Inc.[E]	24,607[E]	—	24,607[E]	—	—	711,219	—	—	48	—	48
67	66	CRA, Inc.	24,001	—	24,001	3,086	624	10,346	(72)	652	242	6	900
64	67	Mobil Alaska Pipeline Co.	22,594	—	22,594	143,086	59,154	392,444	1,678	—	818[F]	—	—
70	68	Calnev Pipe Line Co.	—	22,262	22,262	10,063	5,894	29,341	3,759	—	—	566	566
62	69	Getty Pipeline, Inc.	11,099	10,460	21,559	1,560	3,352	10,033	660	—	29	341	370
72	70	Kenai Pipe Line Co.	20,101	—	20,101	6,133	1,579	12,271	(826)	—	23	—	23
73	71	Chase Transportation Co.	—	20,050	20,050	10,311	8,767	38,530	6,517	—	—	697	697
—	72	Locap, Inc.	19,553	—	19,553	148	10,625	121,061	121,061	—	58	—	58
71	73	Yellowstone Pipe Line Co.	—	18,835	18,835	8,505	1,653	27,891	64	—	—	751	751
69	74	Ohio River Pipe Line Co.	—	18,821	18,821	3,183	716	9,087	3,821	—	—	364	364
75	75	Diamond Shamrock Corp.	—	17,687	17,687	10,259	2,410	32,117	5,130	—	—	622	622
76	76	Portal Pipe Line Co.	16,900	—	16,900	13,300	6,200	33,000	6,000	—	81	—	81
79	77	Kaw Pipe Line Co.	16,346	—	16,346	4,610	905	11,842	(97)	1,401	—	—	1,401
68	78	American Petrofina Pipeline Co.	15,218	866	16,084	4,548	(2,035)	11,308	442	161	538	46	745
74	79	Wyco Pipe Line Co.	—	15,816	15,816	8,445	2,119	23,761	564	—	—	677	677
80	80	Gulf Central Pipeline Co.	—	14,694	14,694	23,265	6,839	120,976	289	—	—	1,945	1,945
78	81	Acorn Pipe Line Co.	14,412	—	14,412	3,680	—	3,336	(6)	—[G]	—	—	—
77	82	Paloma Pipe Line Company	19,945	-0-	13,945	4,304	1,842	5,776	—	—[G]	—	—	—
84	83	Okie Pipe Line Co.	7,224	6,151	13,375	8,160	2,922	14,067	—	500	—	384	884
81	84	Kiantone Pipeline Corp.	12,364	—	12,364	2,383	311	13,050	559	—	78	—	78
82	85	Western Oil Transportation Co., Inc.	11,183	—	11,183	3,102	24,352	14,690	—	UNK.	UNK.	UNK.	UNK.
87	86	Pioneer Pipe Line Co.	—	11,074	11,074	3,852	1,083	11,819	74	—	—	303	303
85	87	Allegheny Pipeline Co.	—	10,778	10,778	6,567	4,187	26,414	1,883	—	—	602	602
86	88	Jet Lines, Inc.	—	9,686	9,686	3,974	947	12,101	645	—	—	111	111
89	89	Interstate Energy Co.	—	9,866	9,866	10,627	—	55,143	305	—	—	94	94
92	90	Trans-Oil Pipeline Co.	—	9,752	9,752	2,520	2,067	13,835	0.8	—	—	133	133
94	91	Amerada Hess Pipeline Corp.	8,293	—	8,293	53,453	18,787	47,211	659	—	(818)[F]	—	—
93	92	Trans Mountain Oil pipe Line Corp.	7,743	—	7,743	324	(1,770)	6,743	—	—	—	—	—
90	93	Union Alaska Pipeline Co.	7,490	—	7,490	45,626	17,885	124,369	—	—	(818)[F]	—	—
91	94	Phillips Alaska Pipeline Corp.	7,471	—	7,471	46,487	21,405	124,648	781	—	(818)[F]	—	—
—	95	Black Lake Pipe Line Co.	6,733	—	6,733	2,480	778	10,043	55	—	255	—	255
98	96	POGO Offshore Pipeline Co.	6,595	—	6,595	3,001	1,264	8,780	833	—	(112)[G]	—	—
97	97	Mobil Eugene Island Pipeline Co.	6,557	—	6,557	3,518	1,019	13,479	365	—	(181)[G]	—	—
99	98	Cheyenne Pipeline Co.	144	5,715	5,859	1,826	741	5,951	32	5	34	220	259
—	99	Ohio Gathering Corp.	5,395	—	5,395	8,818	507	7,246	991	754	—	—	754
95	100	Crown-Rancho Pipe Line Corp.	5,074	—	5,074	1,176	519	2,186	(4)	7	—	—	7

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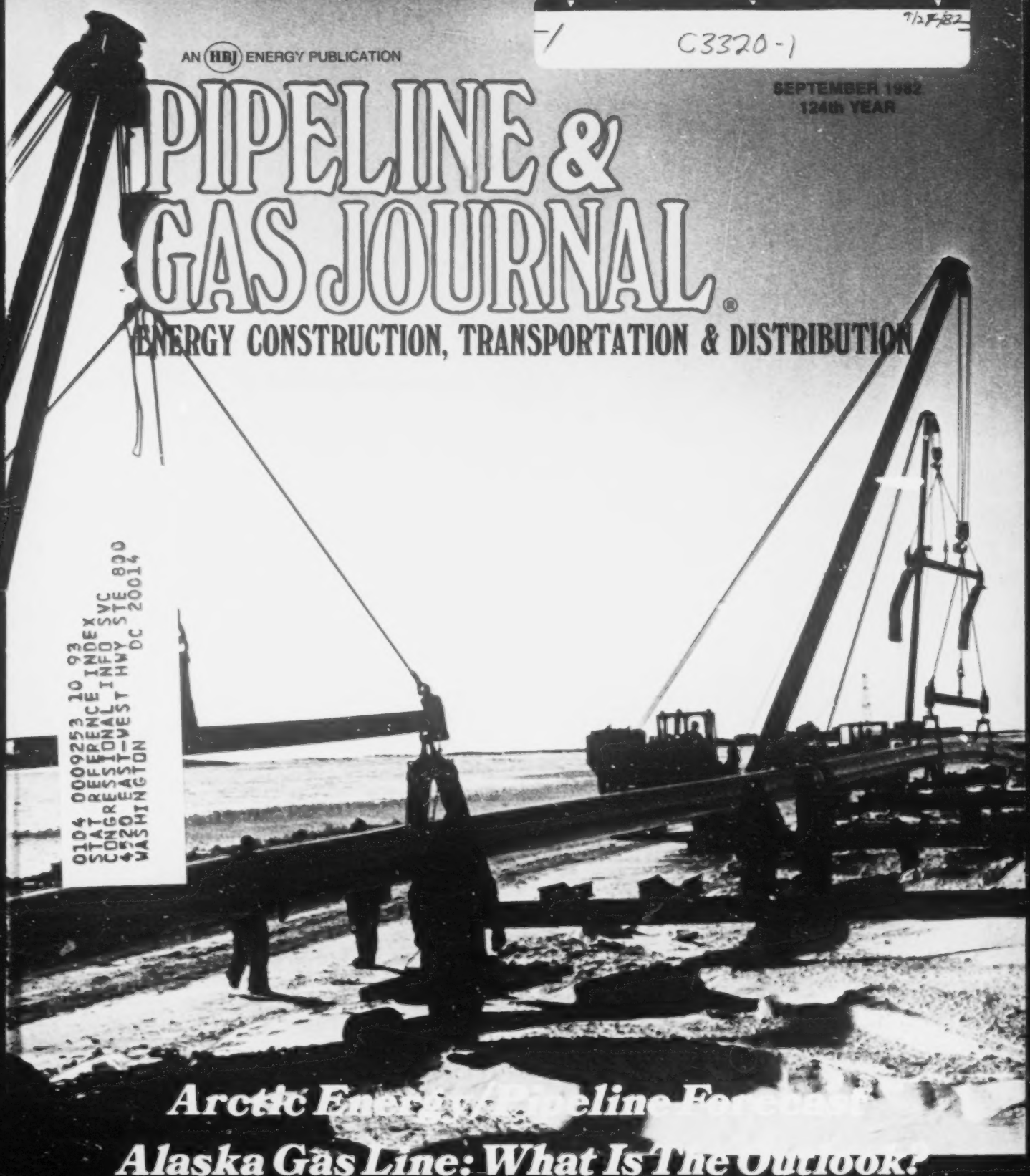

Arctic Fa... ...eline Fe...

Alaska Gas Line: What Is The Outlook?

North Slope Construction Reports

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COVER

Warmly-clad workmen brave the Arctic cold on the North Slope of Alaska as they install an insulated 16-in. oil pipeline from the Kuparuk Field, third largest in terms of reserves in North America, to a tie-in with the trans-Alaska oil pipeline at Prudhoe Bay.

Photo photo courtesy Morrison-Knudsen Construction Co.

North Slope Pipeline Work Strong 17
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Northwest Alaska Pipeline's McMillian Speaks Frankly About Gas Line Future .. 20
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New 27-mile, 16-in. insulated oil pipeline connecting the Kuparuk Field (third largest in North America in terms of reserves) with Prudhoe Bay and the trans-Alaska oil pipeline cross the Kuparuk River on a super-strong, heavy duty system of pile supports.

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Canadian Eastern Leg Complete 65
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New Concept Improves Ultrasonic Inspection Of ERW Pipe 76
Imperfections in longitudinal welds on heavy wall electric resistance welded pipe can be found more precisely at mill speeds with a new inspection system.

Over 100 miles of insulated pipelines will be installed on the North Slope of Alaska during 1982 – and another 120 miles in 1983 – as part of a $10.5 billion project to maintain production capacity. New lines are for waterflood supply systems, low pressure production systems, produced water handling, and gas handling.

North Slope Pipeline Work Strong; Gas Pipeline Project Deferred

by Dean Hale, Editor

Even with an additional two-year delay foreseen for the Alaska Highway Gas Pipeline Project, pipeline construction and planning continues at an energetic level in the colder climes of North America.

Pipeline construction on the North Slope is quite active at both Prudhoe Bay, where Arco and Sohio respectively are installing facilities for a planned waterflood system as well as additional flowlines and other pipelines, and at Kuparuk Field, west of Prudhoe Bay, where development by Arco continues.

The delay of two years in implementing the construction plan for the Alaska Highway Gas Pipeline Project is only a temporary setback, sponsors say, and the project assuredly will be built in the mid-1980s – and possibly sooner if a demand develops for the Alaskan natural gas and there is an economic upturn coupled with a better money market.

Inability to produce a complete financing program by July – to meet an FERC deadline – moved the project sponsors in early May to announce the delay. Informed sources tell P&GJ that two-thirds of the pipeline financing could be arranged – one-third by the pipeline sponsors, one-third by the North Slope producers – and that the producers were not willing to assume part of the remaining one-third. Financing of that elusive "other one-third" may be offered to the state of Alaska and outside (of the gas industry) institutions.

Meanwhile, some 26 Tcf of natural gas remains "frozen" in place on the North Slope and unavailable to the lower 48 states, a market that is also soft with an increasing supply available but unused.

Of the 1972 miles completed of the total 4784 Alaska Highway Gas Pipeline Project, including both western and eastern legs in the U.S., 1335 miles are below the U.S.-Canadian border (Northern Border Pipeline – 823 miles; Pacific Gas Transmission – 161 miles; Northwest Pipeline – 351 miles) and 637 miles in Canada installed by Foothills Pipe Lines. Another 2812 miles remain – 745 in Alaska, 1346 in Canada between the Alaska-Yukon border and James River Junction, and 721 miles of additional line by Pacific Gas Transmission and PG&E. To be built at a later date is the 740-mile, 34-in. Dempster lateral from Whitehorse to the Mackenzie River Delta.

There are alternatives to building the gas pipeline as originally planned, but they have not received serious consideration.

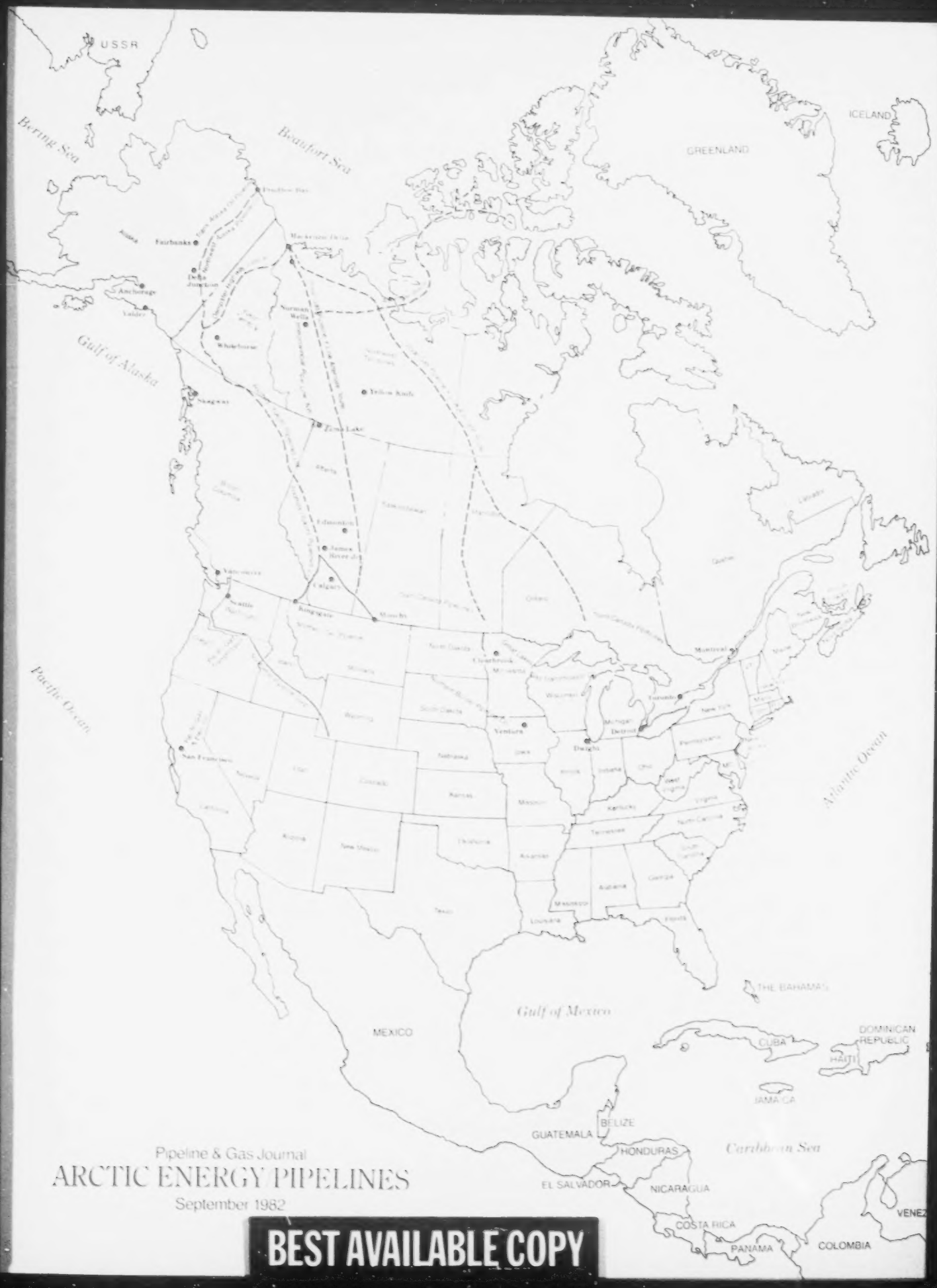
Finally, most of the preliminary field work and design has been completed. Construction planning was well underway when the delay was instituted. Both major contractors – Fluor and Parsons – have greatly reduced their staffs, as has Northwest Alaskan Pipeline in Alaska. Toughest task in the future may be finding qualified personnel to replace those specialized teams of experts.

Other Alaskan Developments

Well over 225 miles of pipelines will be installed on the North Slope during 1982 and 1983 – about one-half of that total during each year. It is all part of a five-year, $10.5-billion program by Sohio and Arco to maintain output from the field to feed the trans-Alaska oil pipeline. And, for the first time, X-70 pipe is being used.

Biggest development is the Prudhoe Waterflood Project that involves nearly 62 miles of 10 through 40-in. insulated pipeline; water injection into the field eventually will reach 3 million bbl/day, of which 2 million bbl will be seawater and 1 million will be produced water.

Development of the Kuparuk Field, third largest in oil field in North America in terms of reserves, continues and that expansion requires many new pipelines in the form of flowlines, produced water lines, gas lines, etc. Kuparuk will also get a waterflood – a pilot study will go on stream in 1983. A new 24-in. oil pipeline to the TAPS Station No. 1 will also be



Pipeline & Gas Journal

ARCTIC ENERGY PIPELINES

September 1982

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Moving Arctic Energy To Market

Status of Projects and Proposals – September 1982

Type	Name	Size and Miles	Location	Status
Oil	Trans-Alaska Oil Pipeline	801 miles, 48-in.	Prudhoe Bay to Valdez	Completed and operating.
Oil	Northern Tier Pipeline Co.	1557 miles, 40 and 42-in.	Port Angeles, Wash. to Clearbrook, Minn.	Federal approval and all state approvals but Washington received; new management to continue project.
Oil	Interprovincial Pipe Line (NW) Ltd.	540 miles, 12-in.	Norman Wells, N.W.T. to Northern Alberta	Approved by NEB, but delayed until 1985.
Gas	ALASKA HIGHWAY GAS PIPELINE PROJECT			
	Northwest Alaskan Pipeline Co.	745 miles, 48-in.	Prudhoe Bay to Alaska-Canada (Yukon) border	Final application for construction certificate made to FERC; delayed two years.
	Foothills Pipe Lines (South Yukon) Ltd.	232 miles, 48-in. 276 miles, 56-in.	Southern Yukon	Expect Canadian federal approval when Alaskan section is approved.
	Foothills Pipe Lines (North B.C.) Ltd.	444 miles, 56-in.	Northern British Columbia	Expect Canadian federal approval when Alaskan section in approved.
	Foothills Pipe Lines (Alberta) Ltd.	394 miles, 56-in.	Alberta	Expect Canadian federal approval when Alaskan section is approved.
	Foothills Pipe Lines (Alberta) Ltd.	• 187 miles, 36-in. • 234 miles, 42-in.	Alberta	Prebuild section. Construction complete.
	Foothills Pipe Lines	105 miles, 36-in.	Southeastern B.C.	Approved. Construction complete on 55 miles.
	Foothills Pipe Lines (Saskatchewan) Ltd.	• 161 miles, 42-in.	Saskatchewan	Completed.
	Northern Border Pipeline Co.	• 823 miles, 42-in.	Monchy, Sask. to Ventura, Iowa	Completed; operational in October 1982.
	Pacific Gas Transmission Co.	• 160.5 miles, 42-in. in four loops.	Idaho, Washington, Oregon	Construction completed; operational in October 1981.
	Pacific Gas Transmission Co. and Pacific Gas & Electric Co.	721 miles, 42-in.		Awaiting FERC approval.
	Northwest Pipeline Co.	• 100 miles, 30-in. • 251 miles, 24-in.	Oregon, Idaho	Loop on existing system; construction completed; operational October 1981.
	Foothills Pipe Lines	740 miles, 34-in.	Near Whitehorse to Mackenzie Delta area	Proposed; estimated cost $2.5 billion (as of June, 1979).
Gas	POLAR GAS PROJECT	3100 miles, 30, 36, 42-in.	High Arctic Islands and Mackenzie Delta to southern Canada	Project plans to file new application with National Energy Board.

• Completed project Partially completed project

built in the future – with the recently built 16-in. oil line to be converted to natural gas.

More development on the North Slope can be expected. Sohio holds leases west of Arco in the Kuparuk Field area and activity is expected to increase there. More exploration and development drilling in the Beaufort Sea is also foreseen; success depends on the ability to hold down costs. A major push will result from extension of the drilling season to 10 months (prohibited in September and October to accommodate the whales in the region).

Oil Line To Beaufort Sea?

Esso's Interprovincial Pipe Line Co. Ltd. reportedly is considering a 500-mile extension from Norman Wells to the Beaufort Sea area of the 540-mile, 12-in. line it will build in 1985 from Norman Wells to Zama Lake in northern Alberta. Pipeline would be cheaper than tanker transportation from the area. Line will be needed somewhere between 1985 and 1990.

Polar Gas Project

Latest planning on the Polar Gas Project, to deliver some 3.3 Bcf of gas per day to southern Ontario, considers several alernative routes to move the gas to market – one plan to pipeline the gas to Alberta-Saskatchewan border connection with TransCanada PipeLines system – another to make connections with TCPL at points much further east. Polar Gas, like the Alaskan gas pipeline, continues to be delayed because of soft market conditions, a tough money market, and need to develop greater reserves to insure viability of the project.

Arctic Pilot Project

Sponsors of the Arctic Pilot project have deferred the project indefinitely. APP's plan for full commercial operation of LNG tanker transportation of gas from the High Arctic Islands to European and eastern Canada customers by 1992 is now up in the air. Established reserves in the Arctic Islands are calculated at 16 Tcf; the APP would draw from 2.4 Tcf in the Drake Point Field on Melville Island. Sponsors originally hoped for NEB approval by late 1982 so that detailed engineering could begin in 1893 and construction in 1984 with completion set for 1987.

Recently discussions with French and West German officials had convinced APP officials that markets existed in European for the Arctic gas in LNG form. Plans for an LNG regasification terminal in eastern Canada would be shelved and all LNG delivered to Europe. Eastern Canada reportedly feels that its market for natural gas can be adequately supplied from gas from Canada's east coast, namely the Sable Island discoveries off Nova Scotia.

Northern Tier Project

Status of the Northern Tier Pipeline, the 1550-mile, 42-in. line from the Seattle area eastward to Clearbrook, Minn. is expected to change under the project's new management. Getty Oil Co. in June acquired approximately two-thirds of the proposed pipeline interests and announced plans to increase efforts to obtain critical state permits from the state of Washington. The project has been cleared for construction elsewhere.

P&GJ

Earnings drop with lower crude prices

by Cindy Mays, *Assistant Editor*
Energy Management Report

Once again, sagging crude oil prices resulted in a decline in earnings for the oil industry in general during the second quarter. Being locked into buying expensive Saudi Arabian oil, however, proved even more costly to Aramco partners Exxon, Texaco, Socal, and Mobil.

Second quarter earnings of 80 companies responding to our survey dropped 15.6 percent from the same period in 1981. Profit margin for the group fell from 4.8 percent to 3.6 percent.

Even though oil prices dropped, Saudi Arabia held firm to its $34 bbl benchmark price, making it extremely difficult for the Aramco partners to recover their costs through refined products. As a result, Socal's earnings were down 57 percent, Mobil, 56 percent, Exxon 52 percent, and Texaco, 44 percent.

Atlantic Richfield, on the other hand, reported a two percent increase in net income, due primarily to improved performance from the Alaska Kuparak River field, higher crude oil production, cost cutting measures, and higher prices for natural gas.

Increased Alaskan production also helped Standard Oil (Ohio), whose earnings dropped a meager 1.1 percent.

Improved domestic refining and marketing operations were partially offset by increased dry hole and exploration expenses and high interest costs resulting in a five percent drop by Union Oil of California.

Higher production from Shell's Kernridge properties in California and from leases in the Gulf of Mexico kept the company's earnings decline down to seven percent.

Heavy losses in Occidental Petroleum's oil and gas division resulted in a 52 percent decrease in second quarter earnings.

Ashland Petroleum's focus on domestic crude oil for an increasing share of its raw material supplies contributed to their 741 percent increase in earnings.

Lower raw material costs and increased refining margins helped Amerada Hess boost their net income 13.7 percent.

Phillips Petroleum reported a 39.1 percent decrease in earnings due to lower worldwide crude oil and natural gas liquids production, lower U.S. natural gas production, and higher exploration costs.

Weak oil markets and competitive pressure resulted in a 32.5 percent drop in earnings for Gulf Oil.

Higher exploration and interest costs coupled with lower profit margins for natural gas liquids and refined petroleum products drove Cities Service earnings down 27 percent.

Sun Co.'s net income declined 32.5 percent following low crude prices and operating problems.

Increased foreign and domestic exploration and production costs, as well as lower crude oil, condensate, and liquid natural gas prices contributed to Getty Oil's 26.1 percent earnings drop. *(Continued)*

GAS COMPANIES SECOND QUARTER FINANCIAL REPORTS

Company	Three months ending June 30** Revenues ($000) 1982	1981	% Chg.	Earnings* ($000) 1982	1981	% Chg.	Six months ending June 30** Revenues ($000) 1982	1981	% Chg.	Earnings* ($000) 1982	1981	% Chg.	Profit‡ Margin 1982	1981
Alabama Tennessee N.G.	29,741	27,065	+ 9.9	1,316	1,313	+ 0.2	67,014	61,129	+ 9.6	2,987	2,951	+ 1.2	4.5	4.8
American Nat. Resources	683,386	590,044	+ 15.8	15,681	15,660	+ 0.1	163,045[3]	114,975[3]	+ 41.8	165,455[3]	134,354[3]	+ 23.1	1.5	16.9
Arkla Inc	307,021	302,421	+ 1.5	26,998	32,602	- 17.2	1,242,809[3]	1,088,217[3]	+ 14.2	93,283[3]	82,185[3]	+ 13.5	7.5	7.6
Columbia Gas	994,259	889,936	+ 11.7	31,256	32,691	- 4.4	2,869,815	2,361,489	+ 21.5	135,219	119,060	+ 13.6	4.7	5.0
Consolidated N.G.	628,728	524,518	+ 19.9	25,273	22,171	+ 14.0	1,829,179	1,567,560	+ 16.7	111,872	93,389	+ 19.8	6.1	6.0
El Paso Companies	956,439	910,869	+ 5.0	18,197	37,772	- 51.8	1,890,386	1,819,164	+ 3.9	39,389	68,676	- 42.6	2.1	3.8
ENSERCH Corp.	901,465	821,566	+ 10.0	36,065	46,197	- 22.0	1,905,925	1,656,408	+ 15.0	93,253	102,120	- 9.0	4.9	6.2
InterNorth	721,377	737,980	- 2.2	21,952	39,305	- 44.1	2,174,210	1,880,595	+ 15.6	128,096	155,667	- 17.7	5.9	8.3
Kansas-Nebraska N.G.	98,848	87,967	+ 12.4	2,738	2,284	+ 19.9	490,374[3]	406,434[3]	+ 20.7	27,222[3]	23,187[3]	+ 17.4	5.5	5.7
Mountain Fuel Supply	306,382	260,301	+ 17.7	34,300	21,743	+ 57.8	531,032[3]	441,350[3]	+ 20.3	31,328[3]	30,424[3]	+ 3.0	5.9	6.9
National Fuel Gas	851,208	755,137	+ 12.7	39,162	38,634	+ 1.4	984,527[3]	852,920[3]	+ 15.4	33,610[3]	33,228[3]	+ 1.2	3.4	3.9
Northwest Energy	302,461	287,177	+ 5.3	1,765	14,169	- 87.5	793,424	715,878	+ 10.8	32,917	37,166	- 11.4	4.1	5.2
ONEOK Inc.	252,537	261,049	- 3.3	10,840	13,899	- 22.0	626,440	594,926	+ 5.3	33,307	36,751	- 9.4	5.3	6.2
Pacific Lighting	1,006,727	803,948	+ 25.2	33,968	33,596	+ 1.1	3,990,896[3]	3,093,247[3]	+ 29.0	113,111[3]	135,703	- 16.6	2.8	4.4
Panhandle Eastern	793,899	845,501	- 6.1	62,603	78,960	- 20.7	1,752,492	1,721,179	+ 1.8	135,964	156,759	- 13.3	7.8	9.1
Pioneer Corp.	254,806	308,022	- 17.3	(13,064)	28,402		557,219	596,177	- 6.5	16,779	57,599	- 70.9	3.0	9.7
Sonat Inc.	611,371	623,444	- 1.9	49,137	40,695	+ 20.7	1,427,044	1,302,064	+ 9.6	112,336	90,820	+ 23.7	7.9	7.0
Southern Union Co.	249,416	239,173	+ 4.3	2,287	9,911	- 74.3	1,068,050[3]	1,039,905[3]	+ 2.7	24,727[3]	41,344[3]	- 40.2	2.3	4.0
Texas Eastern Corp.	1,412,034	1,017,967	+ 38.7	42,752	60,032	- 28.8	2,836,622	2,172,514	+ 30.6	104,677	122,640	- 14.6	3.7	5.6
Texas Gas Transmission	673,294	590,366	+ 14.0	28,422	34,200	- 16.9	1,456,558	1,273,530	+ 14.4	58,213	69,841	- 16.6	4.0	5.5
Texas Oil & Gas	503,970	415,606	+ 21.3	63,308	50,570	+ 25.2	1,420,046[2]	1,149,402[2]	+ 23.5	179,618[2]	138,809[2]	+ 29.4	12.6	12.1
Transco Energy Co.	964,117	919,735	+ 4.8	41,793	31,085	+ 34.4	1,880,775	1,770,568	+ 6.2	77,855	62,471	+ 24.6	4.2	3.5
Union Gas Ltd.	208,840	178,036	+ 17.3	5,465	5,110	+ 6.9								
United Energy Resources	1,377,883	1,274,871	+ 8.1	54,249	53,908	+ 0.6	5,850,431[3]	4,707,209[3]	+ 24.3	224,835[3]	195,968[3]	+ 14.7	3.8	4.2
Westcoast Transmission[1]	215,591	274,994	- 21.6	18,212	16,951	+ 7.4	639,865	646,893	- 1.1	37,746	33,663	+ 12.1	5.9	5.2
TOTAL	15,305,810	13,947,693	+.097	654,675	760,860	- 14.0	38,448,178	31,760,203	+ 21.1	2,013,799	2,024,775	- 0.5	5.2	6.4

*Earnings available to common. **Excluding non-recurring items. ‡Earnings* divided by Revenues.
[1]Three months ending May 31. [2]Nine months. [3]Twelve months.

		Three months ending June 30*						Six months ending June 30**						Profit‡ Margin	
		Revenues ($000)			Earnings* ($000)			Revenues ($000)			Earnings* ($000)				
		1982	1981	% Chg.	1982	1981	% Chg.	1982	1981	% Chg.	1982	1981	% Chg.	1982	1981
1.	Adams Resources & Energy	63,336	53,435	+ 18.5	1,167	(3,231)		114,696	119,174	- 3.8	185	(5,525)		0.2	
2.	Adobe Oil & Gas Corp.	49,878	44,685	+ 11.6	5,828	6,432	- 9.4	103,742	85,104	+ 21.9	11,729	11,940	- 1.8	11.3	14.0
3.	Altex Oil	1,640	1,367	+ 20.0	30	160	- 81.2	4,799[3]	4,034[3]	+ 19.0	186[3]	764[3]	- 75.6	3.9	18.9
4.	Amarex Inc.[1]	13,871	8,800	+ 57.6	410	1,426	- 71.2	28,930	15,830	+ 82.8	1,701	2,146	- 20.7	5.9	13.6
5.	Amerada Hess	1,780,261	2,231,821	- 20.2	61,086	53,716	+ 13.7	4,153,577	5,201,036	- 20.1	44,922	120,820	- 62.8	1.1	2.3
6.	American Pacific	4,601	2,816	+ 63.4	(414)	(542)		10,041[3]	7,672[3]	+ 30.9	1,798[3]	736[3]	+ 144.3	17.9	9.6
7.	American Petrofina	607,993	713,724	- 14.8	10,875	15,251	- 28.7	1,183,207	1,380,198	- 14.3	26,870	35,501	- 24.3	2.3	2.6
8.	Argonaut Energy[2]	7,632	5,383	+ 41.8	(187)	322		1,762	2,737	- 35.6	(69)	155			5.7
9.	Argo Petroleum	5,337	5,832	- 8.5	(1,745)	731		11,029	11,154	- 1.1	(2,338)	1,518			13.6
10.	Ashland Oil	2,217,695	2,516,913	- 11.9	63,756	7,576	+741.6	4,430,846	4,883,005	- 9.3	46,668	9,015	+ 417.7	1.1	0.2
11.	Asamera	100,809	105,410	- 4.4	(498)	546		207,230	218,820	- 5.3	(1,844)	4,150			1.9
12.	Atlantic Richfield	6,808,877	6,968,034	- 2.3	409,778	339,616	+ 2.5	13,236,033	14,100,354	- 6.1	795,187	767,940	+ 3.5	6.0	5.4
13.	Beard Oil	9,724	9,216	+ 5.5	206	1,416	- 85.4	18,833	16,267	+ 15.8	635	2,495	- 74.5	3.4	15.3
14.	Belco Petroleum	80,055	79,574	+ 0.6	24,307	23,269	+ 4.5	161,685	157,311	+ 2.8	51,035	47,896	+ 6.6	31.6	30.4
15.	Brock Exploration[5]	1,459	1,296	+ 12.6	(371)	(232)									
16.	Buttes Gas & Oil	29,602	32,204	- 8.1	(1,322)	(2,517)		83,727	69,834	+ 19.9	740	426	+ 73.7	0.9	0.6
17.	Cities Service	2,178,900	2,177,500	+ 0.1	74,400	102,000	- 27.1	4,456,300	4,376,400	+ 1.8	127,700	168,200	- 24.1	2.9	3.8
18.	Consolidated O&G	8,660	11,229	- 21.9	(140)	1,711		21,556	24,350	- 11.5	(2,312)	3,693			15.2
19.	Crown Central	421,368	380,785	+ 10.7	2,901	3,915	- 25.9	839,634	758,613	+ 10.7	(5,947)	6,313			0.8
20.	Crystal Oil	45,099	75,806	- 40.5	(1,119)	1,598		106,126	145,152	- 26.9	(1,902)	25			
21.	Diamond Shamrock	857,709	810,448	+ 5.8	31,926	55,248	- 42.2	1,648,844	1,683,098	- 2.0	61,075	116,022	- 47.4	3.7	6.9
22.	Discovery Oil	1,414	1,893	- 25.3	(411)	258		2,381	3,899	- 38.9	(646)	575			14.8
23.	Dorchester Gas[2]	376,224	166,418	+ 126.1	4,340	7,583	- 42.8	805,530[3]	481,191[3]	+ 67.4	13,778[3]	23,583[3]	- 41.6	1.7	4.9
24.	Eagle Exploration[5]	476	203	+ 136.0	(525)	(70)									
25.	Enstar Corp.	88,059	85,241	+ 3.3	8,976	6,284	+ 42.8	179,507	171,608	+ 4.6	19,517	24,230	- 19.5	10.9	14.1
26.	Equity Oil	5,739	6,835	- 16.0	467	1,736	- 73.1	11,757	12,441	- 5.5	1,706	2,887	- 40.9	14.5	23.2
27.	Felmont	21,199	17,178	- 123.4	4,269	3,297	+ 29.5	39,227	36,225	+ 8.3	7,133	8,634	- 17.4	18.2	23.8
28.	Forest Oil Corp.	36,732	34,900	+ 5.4	1,815	946	+ 91.9	75,861	65,994	+ 15.0	5,240	3,228	+ 62.3	6.9	5.0
29.	Getty Oil	3,078,275	3,216,549	- 4.3	151,263	204,775	- 26.1	6,202,852	6,511,170	- 4.7	314,909	434,705	- 27.6	5.1	6.7
30.	Gulf Energy & Develop.	18,800	14,112	+ 33.2	1,054	1,726	- 38.9	34,174	28,181	+ 21.3	1,488	3,289	- 54.8	4.4	11.7
31.	Gulf Oil Corp.	7,426,000	7,206,000	+ 3.1	210,000	311,000	- 32.5	14,965,000	15,807,000	- 5.3	477,000	614,000	- 22.3	3.2	3.9
32.	Hershey Oil	1,824	1,177	+ 55.0	126	214	- 41.1	3,610	2,752	+ 31.2	351	672	- 47.8	9.7	24.4
33.	Holly Corp.[6]	134,018	93,725	+ 43.0	1,427	382	+273.6	218,478	190,129	+ 48.0	7,221	1,769	+ 308.2	2.6	0.9
34.	Howell Corp	63,924	56,377	+ 13.4	759,000	270,000	+118.1	130,762	104,106	+ 25.6	1,553	915	+ 69.7	1.2	0.9
35.	Howell Petroleum	20,883	22,650	- 7.8	2,472	1,749	+ 41.3	43,697	44,829	- 2.5	4,514	3,568	+ 26.5	10.3	8.0
36.	Inexco Oil	55,699	61,694	- 9.7	4,418	8,447	- 47.7	118,526	114,592	+ 3.4	12,025	14,792	- 18.7	10.1	12.9
37.	KRM	1,309	1,382	- 5.3	35	244	- 85.7	2,679	2,734	- 2.0	165	498	- 66.9	6.2	18.2
38.	Kerr-McGee Corp.	911,850	890,812	+ 2.4	50,235	51,445	- 2.4	1,848,505	1,806,938	+ 2.3	79,404	94,782	- 16.2	4.3	5.2
39.	Lear Petroleum	48,221	38,903	+ 24.0	498	356	+ 39.9	102,927	77,963	+ 32.0	(1,267)	3,441			4.4
40.	Mapco Inc.	481,841	505,373	- 4.7	17,878	29,009	- 38.4	962,677	1,085,394	- 11.3	33,891	54,444	- 37.8	3.5	5.0
41.	May Petroleum	7,765	10,494	- 26.0	(2,269)	1,922		15,479	19,751	- 21.6	(3,418)	4,562			23.1
42.	Maynard Oil	8,144	11,015	- 26.1	(1,665)	1,613		19,482	20,997	- 7.2	(649)	3,929			18.7
43.	McFarland Energy	3,701	3,826	- 3.3	793	1,154	- 31.3	7,460	7,811	- 4.5	1,779	2,239	- 23.6	23.9	29.8
44.	Mesa Petroleum	99,820	100,911	- 1.1	35,880	26,074	+ 37.6	203,959	204,535	- 0.3	69,109	55,915	+ 23.6	33.9	27.3
45.	Mobil Corp.	15,800	16,600	- 5.0	310,000	700,000	- 56.0	32,200,000	33,700,000	- 4.0	636,000	1,340,000	- 53.0	2.0	4.0
46.	Moran Energy	24,330	24,831	- 2.0	1,825	4,559	- 60.0	53,389	48,959	+ 9.0	5,908	9,915	- 40.4	11.1	20.3
47.	Murphy Oil	598,551	660,021	- 9.3	41,705	44,995	- 7.3	1,342,907	1,326,827	+ 1.2	74,083	83,425	- 10.0	5.6	6.3
48.	Natomas	405,670	370,276	+ 9.6	46,330	57,557	- 19.5	795,299	735,706	+ 8.1	96,184	115,794	- 16.9	12.1	15.7
49.	Noble Affiliates	107,644	93,402	+ 15.3	20,247	18,341	+ 10.4	222,372	180,905	+ 22.9	42,685	36,391	+ 17.3	19.2	20.1
50.	Norris Oil	662	812	- 18.5	(154)	15		1,337	1,330	+ 0.5	54	23	+ 134.8	4.0	1.7
51.	Oxoco	8,854	5,023	+ 76.3	1,741	1,184	- 47.0	16,356	8,766	+ 86.6	3,432	1,659	+ 106.9	21.0	18.9
52.	Pennzoil Co.	588,689	672,115	- 12.4	44,776	59,085	- 24.2	1,175,865	1,360,103	- 13.5	84,729	119,319	- 29.0	7.2	8.8
53.	Phillips Petroleum	4,029,817	4,072,955	- 1.1	139,921	229,767	- 39.1	7,842,839	8,301,424	- 5.5	328,735	500,551	- 34.3	4.2	6.0
54.	Prairie Producing Co.	6,401	8,037	- 20.4	2,380	4,760	- 50.0	13,531	14,557	- 7.0	1,083	1,609	- 32.7	8.0	11.0
55.	Quarker State	251,368	226,221	+ 11.1	14,011	7,367	+ 90.2	476,631	445,655	+ 7.0	19,835	11,003	+ 80.3	4.2	2.5
56.	Sabine Corp.	48,658	42,992	+ 13.2	7,667	7,422	+ 3.3	96,538	85,435	+ 13.0	13,393	16,035	- 16.5	13.9	18.8
57.	Seneca Oil	5,642	2,649	+ 113.0	(1,102)	132		16,120[3]	8,491[3]	+ 89.9	(1,629)[3]	1,516[3]			17.9
58.	Shell Oil	5,105,000	5,554,000	- 8.1	380,000	410,000	- 7.3	9,947,000	10,967,000	- 9.3	724,000	771,000	- 6.0	7.3	7.0
59.	Southland Royalty	92,910	104,647	- 11.2	8,193	10,423	- 21.4	187,748	200,327	- 6.3	16,789	20,410	- 17.7	8.9	10.2
60.	Southwestern Energy	12,859	11,026	+ 16.6	2,517	2,335	+ 7.8	33,870	32,033	+ 5.7	6,831	7,853	- 13.0	20.2	24.5
61.	Standard California	9,370,000	10,979,000	- 14.7	263,000	616,000	- 57.3	19,390,000	22,967,000	- 15.6	493,000	1,282,000	- 61.5	2.5	5.6
62.	Statex Petroleum	3,710	2,336	+ 58.8	786	333	+ 13.6	7,078	4,840	+ 46.2	1,367	922	+ 48.3	19.3	19.0
63.	Sun Co.	4,000,000	3,648,000	+ 9.7	110,000	163,000	- 32.5	8,000,000	7,648,000	+ 4.6	234,000	283,000	- 17.3	2.9	3.7
64.	Sundance Oil	27,750	7,524	+ 268.8	1,487	600	+147.8	51,114	13,774	+271.1	1,700	(3,288)		3.3	
65.	Superior Oil	505,887	504,181	+ 0.3	74,407	99,295	- 25.1	1,036,571	997,087	+ 4.0	155,708	207,255	- 24.9	15.0	20.8
66.	Tenneco	3,735,000	3,742,000	- 0.2	188,492	187,614	+ 0.5	7,549,000	7,518,000	+ 0.4	301,877	365,626	- 17.4	4.0	4.9
67.	Tesoro Petroleum	556,314	655,242	- 15.1	15,500	15,721	- 1.4	1,806,153	2,345,813	- 23.0	34,865	62,035	- 43.8	1.9	2.6
68.	Texaco Inc.	11,500,000	14,800,000	- 22.3	305,000	556,000	- 45.1	24,500,000	30,300,000	- 19.1	672,000	1,214,000	- 44.6	2.7	4.0
69.	Texas American	45,121	55,156	- 18.2	(1,833)	(940)		114,834	136,454	- 15.9	169	298	- 43.3	0.1	0.2
70.	Texas International	45,655	37,168	+ 22.8	3,663	4,334	- 15.5	90,432	70,896	+ 27.6	6,959	6,188	+ 12.5	7.7	8.7
71.	Tomlinson Oil[2]	23,154	37,857	- 38.8	(1,249)	(2,093)		74,295[3]	104,526[3]	- 28.9	(3,727)[3]	(2,852)[3]			
72.	Transcontinental Energy	15,191	23,977	- 36.6	(2,380)	2,981		35,138	46,421	- 24.3	(3,018)	5,037			10.9
73.	Tribune Oil	557	657	- 15.2	165	208	- 20.7	1,126	1,220	- 7.7	346	372	- 7.1	30.7	30.5
74.	Union California	2,909,700	2,799,700	+ 4.0	197,600	207,900	- 5.0	5,391,300	5,476,500	- 1.6	336,100	362,400	+ 1.0	6.8	6.6
75.	Universal Resources	14,507	15,442	- 6.1	2,222	3,513	- 36.8	31,592	29,587	+ 6.8	3,230	6,321	- 17.3	16.6	21.4
76.	Wainoco Oil	12,312	9,905	+ 24.3	(3,661)	125		25,910	20,206	+ 28.2	(6,407)	1,138			5.6
77.	Wilshire Oil of TX	3,315	4,022	- 17.6	2,442	1,402	+ 74.2	6,342	7,489	- 15.30	4,114	2,205	+ 86.6	64.9	29.4
78.	Wiser Oil	13,040	16,527	- 21.1	3,702	4,253	- 13.0	27,840	33,166	- 16.1	7,344	8,990	- 18.3	26.4	27.1
79.	Woods Petroleum	20,836	16,055	+ 30.0	5,903	4,074	+ 44.9	41,168	32,432	+ 26.9	11,670	8,741	+ 33.5	28.4	27.0
80.	Worldwide Energy	12,225	13,031	- 6.2	360	368	- 2.2	26,370	25,661	+ 2.8	650	433	+ 50.1	2.5	1.7
TOTAL		72,854,625	78,556,417	- 7.3	4,133,634	4,896,935	- 15.6	180,616,783	196,279,984	- 0.8	6,544,111	9,499,410	- 31.1	3.6	4.8

** Excluding non-recurring items. *Earnings available to common stock. ‡Earnings* divided by Revenues. [1]Ends April 30. [2]Ends May 31. [5]Ends March 31. [6]Ends January 31. [3]Nine months. [4]Twelve months. ( ) Loss.

Diamond Shamrock's second quarter earnings decreased 42.2 percent due to prolonged impact of the recession on the company's chemical operations.

Dorchester Gas net income fell 42.8 percent as a result of higher net interest cost and lower average liquid natural gas prices.

Southland Royalty reported a 21 percent decline in earnings because of lower crude oil prices.

The combination of higher selling prices for gasoline and fuel oils and the effects of cost controls gave Quaker State Oil Refining a 90.2 percent increase in net income.

The 25 gas companies responding to our survey posted a 14 percent decline in net earnings for the second quarter. Profit margin for the group fell from 6.4 percent to 5.2 percent.

A substantial increase in earnings from The El Paso Company's exploration and production activities were more than offset by the adverse effects of reduced margins and sales volumes of chemical products and higher interest expense. A reduction in gas market demand also contributed to the company's 51.8 percent decline in net income.

Southern Union reported a 74.3 percent decrease in earnings due to low demand and weak prices.

Columbia Gas System's earnings were adversely affected by higher natural gas rates on the company's markets and lower gas production.

The start-up of the 285-mile interstate Ozark Gas Transmission System helped Texas Oil & Gas post a 25.2 percent second quarter gain.

FINANCIAL NOTEBOOK

Mergers/acquisitions. Santa Fe International will acquire Andover Oil (Tulsa) for about $150 million. The privately held oil/gas exploration company had revenues of $78 million last year.

American Public Energy will merge into subsidiary, Amquest Corp.

Gulf Energy & Development purchased all Pano Tech Exploration (Houston) outstanding stock.

Diamond Shamrock agreed to acquire Sigmor Corp. (San Antonio) for about $160 million. Deal includes Sigmor's petroleum refinery, about 600 retail gasoline stations, a crude oil and refined products pipeline network, and a pipe distribution company.

Callon Petroleum agreed to purchase Amwar Petroleum (Oklahoma City) for 300,000 common shares and up to 200,000 shares payable in 1985.

Contracts. C-E Natco (Combustion Engineering) received $2.5 million in orders from Getty Oil for offshore production processing equipment and steam generation units for use in enhanced oil recovery.

Pe Ben Oilfield services received a subcontract from Pe Ben Pipelines on a gas pipeline looping project for Union Gas Ltd. of Toronto.

Defense Logistics Agency awarded contracts to: Exxon International, $203.4 million for jet fuel and gasoline; Puerto Rico Sun Oil, $21.8 million for marine diesel fuel; L.A. Swann Oil, $10.2 million for burner oil.

Money markets. Blocker Energy agreed to restructure $160 million of secured debt under a long-term credit agreement with a group of eight domestic and international banks due to a $21 million second quarter write-down on all its oil/gas properties.

H&H Tool plans to purchase up to 100,000 of its common shares on the open market.

Transco Energy's Transcontinental Gas Pipe Line unit plans to file for the sale of $75 million in intermediate-term debentures.

Wyoming Interstate (Coastal Corp.) completed project financing arrangements for its 269-mile central segment of the Trailblazer Pipeline System.

Standard Oil (Ohio) guaranteed the $171 million of newly acquired Kennecott Corp.'s 7⅞ debentures outstanding.

Exploration pacts. Husky Oil Operations, Bow Valley Industries, and Petro-Canada received permits to explore for oil/gas for three years on 4.2 million acres offshore Sable Island, Nova Scotia.

Petro-Canada International Assistance and Petroleum Corporation of Jamaica signed an agreement under which Canadian companies will provide equipment and technology to Jamaica for onshore drilling operations and assessment of the country's onshore and offshore oil/gas potential through surveys.

Natomas Petroleum (Bahamas) and BP Petroleum Development were awarded two petroleum licenses by the Commonwealth of the Bahamas.

Amoco Morocco Oil (Standard Oil Indiana) and the Moroccan government signed an agreement for oil/gas exploration off the Mediterranean coast of that country.

Irish government awarded an exploration license for three offshore blocks off Southern Ireland in the Celtic Sea to Diamond Shamrock, Total Marine Ireland, Weeks International, Clyde Petroleum, Bow Valley Industries, and Gaelic Oil.

Projects. Suncor plans to upgrade its Sarnia, Ontario refinery for $335 million to reduce its crude oil requirements to 50,000 b/d from 76,100 b/d in 1981 and more than double production of gasoline and diesel oil to about 80% of capacity.

Joint ventures. A.B.C. Energy (Toronto) entered into a joint venture with Energy Associates (Wichita, KS) to participate in a working interest in Pennsylvania's Parker Field.

Briefs. Standard Oil (Ohio) formed an operating company, Sohio Oil to include all downstream petroleum activities including crude trading and transportation, petroleum products and refining, retail marketing, and wholesale marketing and distribution.

Dome Petroleum (Calgary) is cutting its U.S. workforce of about 245 down by 25% percent.

Mitchell Energy & Development acquired additional working interests in about 100 producing oil/gas wells in North Texas from Now Petroleum (Miles Production) and two limited partnerships.

Co-operative Energy Corp. was formed by Canadian government and 20 financial agriculture, service, and marketing co-operatives to explore for oil/gas.

An American and Canadian consortium started drilling for oil offshore Guyana last month. ■

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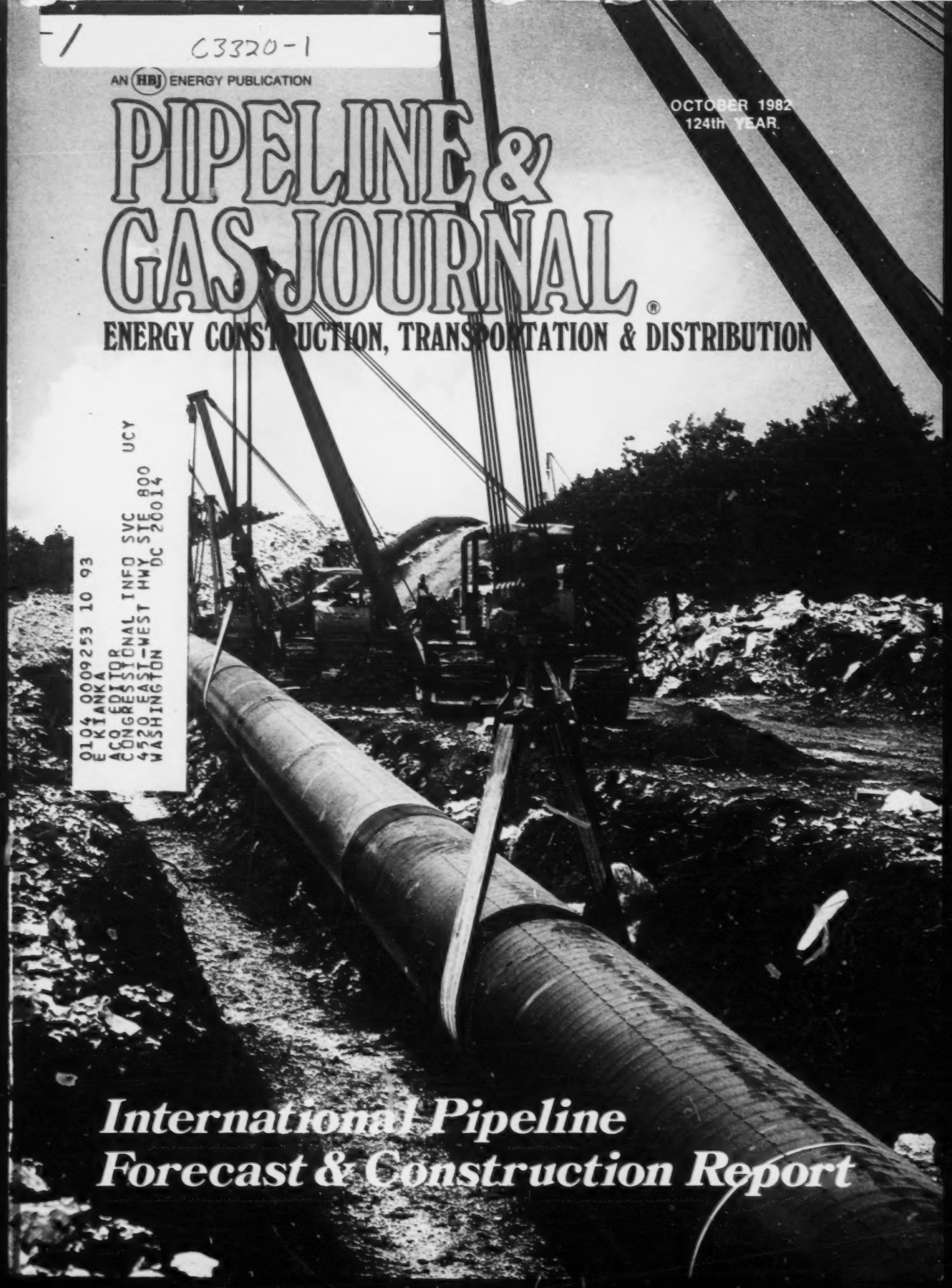

International Pipeline Forecast & Construction Report

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COVER

Construction of the Trans-Mediterranean Pipeline's 48-in. gas line across Italy from South to North continues in the central section near Rome; line will now be completed as a 48-in. instead of 42-in. in northern section.

— photo courtesy Saipem S.p.A.

World Pipeline Plans Total Over 100,000 Miles, $146 Billion..... 18

Natural gas lines dominate in future pipeline plans as well as pipelines under construction, latest P&GJ survey indicates; over 80,558 miles are planned or underway in Free World; projects of all sizes planned all over the globe.

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Many obstacles had to be overcome in the planning, design, and construction of the twin Sydney-Newcastle pipelines.

Longest Continuously Heated Oil Line Completed In Sumatra..... 84

Zamrud field in central Sumatra now in production by P.T. Caltex Pacific Indonesia – thanks to a 63.75-mile, 24-in. insulated and heated pipeline.

New Identification System Aims At Thwarting Equipment Theft..... 90

New system developed by Deere & Company utilizes Product Identification numbers, promises to help in finding lost/stolen equipment.

Santos' 411-Mile Liquids Line Will Be Operational In December..... 100

New outlet for crude oil, gas liquids from Cooper Basin fields – line from Moomba to Stony Point – completed in less than one year.

International Pipeline Forecast

World Pipeline Plans Total Over 100,000 Miles, $146 Billion

by Dean Hale, *Editor*

International pipeline construction in 1983 (outside the United States) will require expenditures in excess of $9.5 billion for the installation of over 12,100 miles of natural gas, crude oil, refined products, natural gas liquids, carbon dioxide, and slurry pipelines.

Presently, there are 100,418 miles of all types of pipelines planned or under construction internationally. That includes 80,558 miles of planned or underway lines in the free world and 19,860 miles of planned and underway lines in the U.S.S.R., the eastern bloc countries, and China. Estimated cost of these lines is $146.1 billion.

During 1982, some 13,227 miles of pipelines will be completed worldwide, at a cost of $8.9 billion. Major new pipeline system construction has slowed for a variety of reasons, including lessened economic activity in most areas of the world, an increasing supply of oil and gas that exceeds demand, the high cost of money, and inflationary pressures. Recent armed conflicts in several areas of the world have also

INTERNATIONAL PIPELINE CONSTRUCTION

(As of October 1982)

	Miles		
Type of Line	Total	Underway	Planned
Natural Gas	68,568	10,139	58,429
Crude Oil	17,858	1,794	16,064
Petroleum Products	12,198	1,186	11,012
Slurry	1,794	—	1,794
TOTALS	100,418	13,119	87,299

INTERNATIONAL PIPELINES PLANNED OR UNDER CONSTRUCTION

(as of October 1, 1982)

Area	Gas Pipelines			Crude Oil Pipelines			Products Pipelines			Slurry Pipelines			TOTALS		
	Planned	Underway	Total	Planned	Underway	Total	Planned	Underway	Total	Planned	Underway	Total	Planned	Underway	Total
Canada	10267	529	10796	1525	0	1525	417	0	417	500	0	500	12709	529	13238
Mexico & Central America	0	68	68	796	78	874	1160	186	1346	—	—	—	1956	332	2288
South America	8899	444	9343	3804	239	4043	1761	125	1886	143	0	143	14607	808	15415
Europe	12411	2888	15299	723	308	1031	507	138	645	—	—	—	13641	3334	16975
Africa & Middle East	7757	2170	9927	5012	1169	6181	4976	0	4976	—	—	—	17745	3339	21084
Southeast Asia, Korea, Japan, Pacific	3942	269	4211	1142	0	1142	964	220	1184	620	0	620	6668	489	7157
Australia & New Zealand	3153	149	3302	157	—	157	236	517	753	189	0	189	3735	666	4401
TOTALS	46429	6517	52946	13159	1794	14953	10021	1186	11207	1452	0	1452	71061	9497	80558
Other (USSR, Eastern Bloc, China)	12000	3622	15622	2905	0	2905	991	0	991	342	0	342	16238	3622	19860
WORLD TOTALS (miles)	58429	10139	68568	16064	1794	17858	11012	1186	12198	1794	0	1794	87299	13119	100418
WORLD TOTALS (km)	93486	16222	109709	25702	2870	28573	17619	1898	19517	2870	0	2780	139678	20990	160669

had a strong effect on planned construction.

For 1983, the outlook is for a continuation of the current construction pace with possibly some acceleration in activity – based on the results of PIPELINE & GAS JOURNAL's survey of world pipeline activity.

During 1982, the P&GJ Survey indicates that 6988 miles of gas transmission, field, and gathering lines will be completed; 4081 miles of crude oil trunk lines and gathering lines; 1626 miles of refined petroleum products and natural gas liquids pipelines, and 532 miles of offshore oil and gas pipelines and gathering lines.

The 1982 total includes continuing work on – and completion of many – projects, both major and minor. Among these are the final sections of British Gas Corp.'s 42-in. Fourth Feeder Line from St. Fergus southward; the central section of the Trans-Mediterranean Pipeline in Italy; 1982 work on the Danish gas transmission system, onshore and offshore; a big chunk of oil and gas lines in Saudi Arabia, Oman, Kuwauit, Abu Dhabi, and other Middle East countries; Australia's 411 miles of liquids line from Moomba to Stony Point, and numerous other projects.

Although many widely publicized major projects have been completed, there remain even more that promise to keep international pipeline construction an exciting business for many years ahead. Of the planned 71,061 miles of free world pipeline projects listed in the P&GJ survey, 65.3% of the mileage is for natural gas lines, 18.5% is for crude oil pipelines, 14.1% is for products pipelines, and 2.1% is for slurry pipelines.

Of the 9497 miles of pipelines under construction, 68.6% are gas pipelines, 18.9% are crude oil lines, and 12.5% are products pipelines.

In the free world, Africa and the Middle East leads the list with a total of 21,084 miles of which 17,745 miles are planned; Europe is in second place, with 16,975 miles total and 13,641 miles planned; South America is a healthy third with 15,415 total miles and 14,607 planned miles; Canada follows in fourth place with 13,238 total miles and 12,709 miles planned. Southeast Asia/Pacific/Orient area has 7157 total miles and 6668 miles planned; Australia and New Zealand total 4401 miles with 3735 planned, and Mexico and Central America report a total of 2288 miles and 1956 miles planned.

The Soviet Union, not including some far-distant multiple 3100-mile large diameter gas pipelines, has a reported 14,070 miles with 10,448 miles planned.

Optimism about the future of international pipeline construction activity is based on the fact that demand worldwide for oil and gas is increasing, and that there have been many significant new oil and gas discoveries around the world – leading to increasing amounts of oil and gas energy that must be moved to consuming markets. Result is that a backlog of new facilities to move this energy has been created and, with improvement in interest rates and economic conditions, will foster a surge of pipeline building activity.

World energy usage is changing, too, as more natural gas is discovered and is being substituted for oil whenever possible. In the energy market, natural gas is highly competitive because it is easier to utilize and easier to handle. Worldwide, some big domestic markets for natural gas will continue to expand. Gas distribution grids are being planned in most countries where they do not exist – and expanded where they do exist.

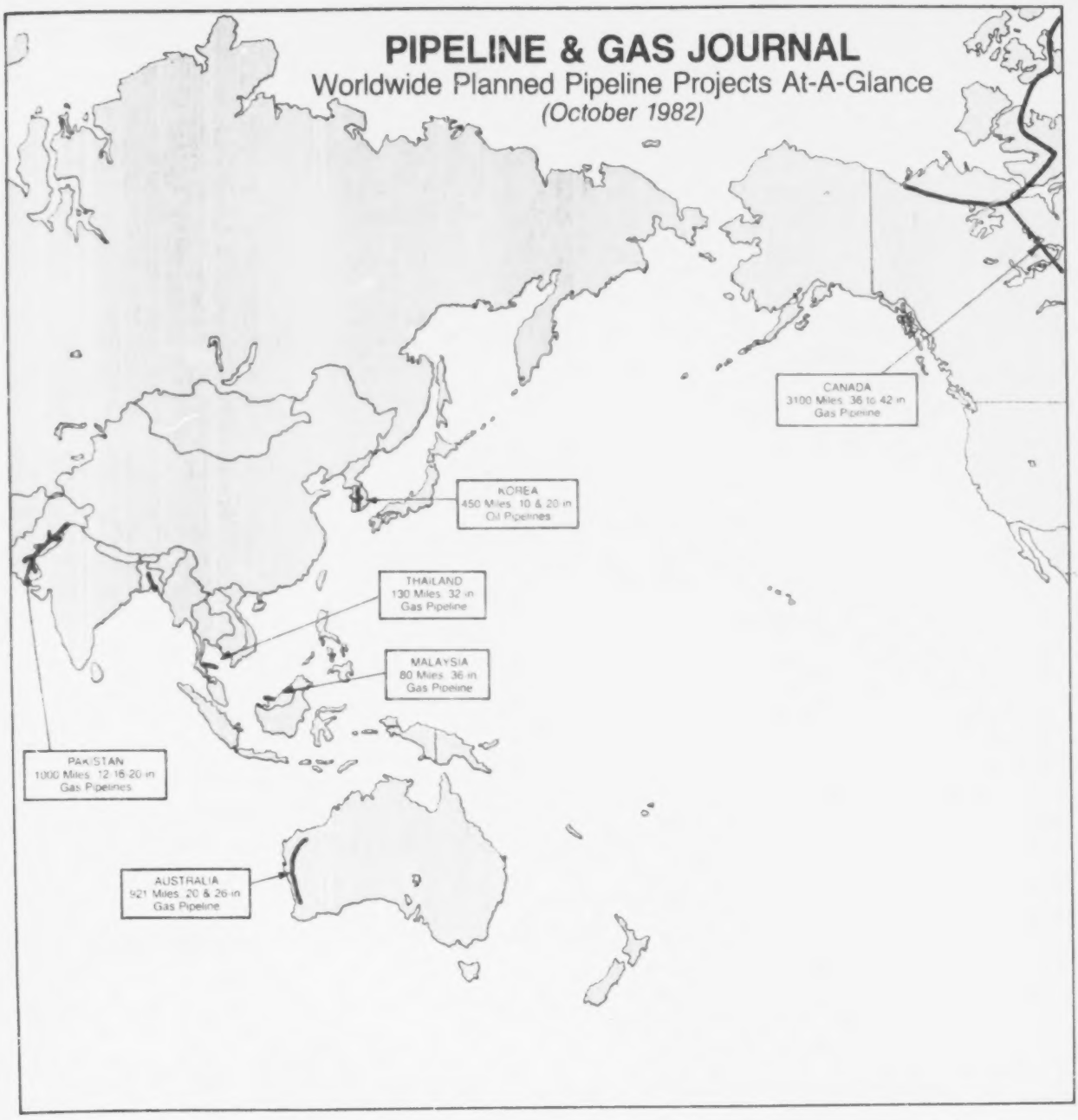
Gas consumption is also expanding in basic industries essential to economic development – such as electric generation, petrochemicals, fertilizers, steel and iron production, cement, and food processing. A recent International Gas Union report says that world gas demand could rise from 1.6 trillion cu m in 1980 to 2.3 trillion cu m in 1990 and 2.76 trillion cu m in the year 2000. An increase in pipeline capacity of 50% to 80% over present capacity will be needed to accommodate that demand. And, IGU says, even at the high production

1982 International Pipeline Construction*

(Estimated Miles Completed During 1982)

Gas Transmission	5688
Gas Field, Gathering	1300
TOTAL	**6988**
Crude Trunk Lines	2536
Crude Gathering	1545
TOTAL	**4081**
Products Lines	1181
NGL, LPG Lines	445
TOTAL	**1626**
Offshore Oil Lines	280
Offshore Gas Lines	252
TOTAL	**532**
GRAND TOTAL	**13,227**

*Includes all free world (outside U.S.) plus Soviet Bloc and China



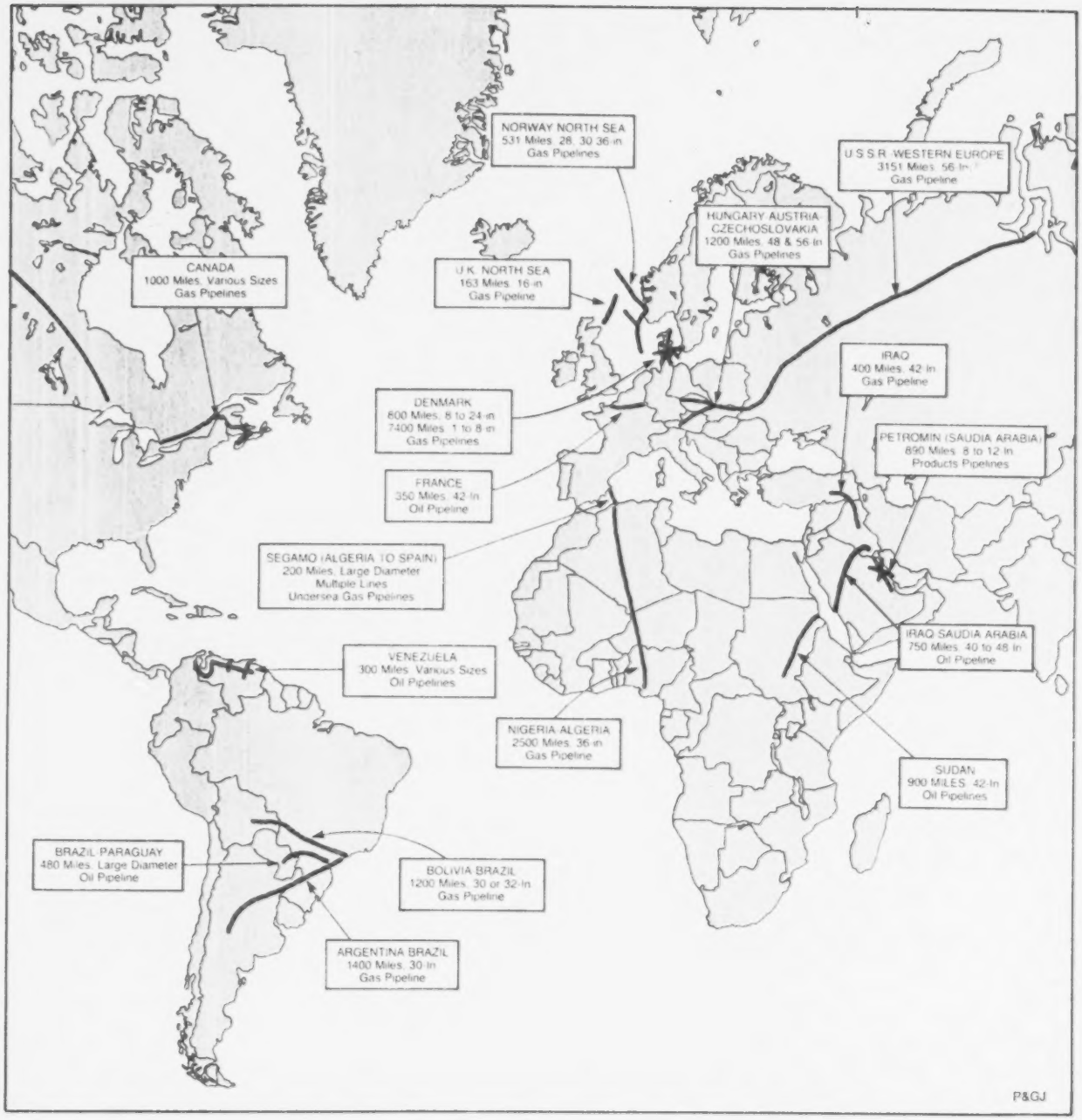
rate forecast, only one-third of the world's gas reserves will have been produced by 2020.

Key issues in expanding the vast pipeline networks and the use of gas as forecast are availability, cost, and security of supply. The latter will become critical as western nations, which have less than 25% of the remaining recoverable reserves, must import greater volumes of gas. Bulk of tomorrow's gas will be transported through pipelines. A relatively minor part will move by ocean (LNG) transport.

Debate continues in Europe about the role that natural gas will assume there in the next decade – will it or will it not provide 20% of the primary energy market. Most producers and distributors believe the answer lies in price – too high a price will exclude natural gas and find a return to oil and coal. The three principal future gas suppliers to Europe are Algeria, the Soviet Union, and Norway. Norway, new entrant into the gas supply realm, is building a 531-mile underwater system in the North Sea to move gas to Ekofisk and then to the Continent. Norway's Statoil says a higher price than paid now will be necessary to recover its investment in facilities to make gas available.

Russia's Sojuzgasexport views the 40 billion cu m of Siberian gas that it expects to supply to Western Europe annually as essentially a replacement for crude oil in the European market. The Siberian gas would also replace diminishing supplies now being provided from Dutch gas fields and, in France, local gas fields that are also diminishing. Algeria, with vast quantities of gas available, is expected to remain a major supplier to Europe but, because of its internal problems, will continue to press for higher prices.

U.S.S.R.'s 3151-mile, 56-in. gas pipeline from Urengoi fields in Western Siberia is being built despite pressure from the U.S. on its western European allies to slow or stop the flow of equipment and materials to the U.S.S.R. for the line's construction. The U.S. sanctions are seen as not being effective, and the Soviets have responded with renewed effort in the line's construction, noting that they will utilize Russian-made equipment wherever possible.



The 56-in. line will terminate at Uzhgorod on the U.S.S.R. – Czechoslovakian border, where gas will be delivered into new pipelines planned for the eastern bloc countries – lines that will deliver the gas, ultimately, to France, Italy, West Germany, Belgium, Netherlands, and eventually to Spain.

The delivery system in Czechoslovakia, involving 900 km of 56-in. pipe, is to begin construction sometime in 1983. The line goes northeast through Czechoslovakia. In East Germany, some 400 km of 48-in. line will be built and in Hungary, 550 km of 48-in. will be built, assuming that Italy does agree to take the Soviet gas. The line going southeast through Hungary will deliver gas at the Austrian border – and the Austrian section of the line that will deliver gas to Italy will involve 220 km of 48-in.

No details have been announced in West Germany about delivery system plans there, but some 550 to 650 km of 40, 42, or 48-in. gas pipeline reportedly are being considered. Additional pipeline capacity will also be needed in northern Italy to deliver gas to a connection with the north end of the Trans-Mediterranean Pipeline running north-south in that country. Trans-Med and Italy's national gas agency, SNAM, have already changed the final section of the big line from 42-in. to 48-in. in anticipation of the new source of supply.

Overlooked in much of the hullabaloo about the new Soviet pipeline is that the Soviet Union has been supplying gas to Western Europe for a long time. Soviet gas supplies the East-West system in Europe, built in 1973, received in West Germany at Waidhaus. Soviet gas via the Orenburg line supplies the MEGAL (Middle European Gas Line) system, completed in 1980, which delivers gas to France and West Germany. Soviet gas has long been supplied through the Trans-Austrian Gas Line to Czechoslovakia, East Germany, Austria, and Italy.

European Developments

Much of the activity in Western Europe in 1982 centered around the North Sea, where numerous oil and gas lines were constructed in 1982, and where future activity is planned.

(Continued)

INTERNATIONAL PIPELINE CONSTRUCTION – BY COUNTRIES

(Underway, Planned, and Proposed – October 1982)

Country	Total Miles, Gas Pipelines			Total Miles, Crude Oil Pipelines			Total Miles, Products Pipelines			Total Miles, Slurry Pipelines			Total Miles, All Pipelines		
	Planned	Underway	Total	Planned	Underway	Total	Planned	Underway	Total	Planned	Underway	Total	Planned	Underway	Total
Abu Dhabi	275	185	460	64	0	64	—	—	—	—	—	—	339	185	524
Algeria	2187	815	3002	0	393	393	324	0	324	—	—	—	2511	1208	3719
Argentina	4136	0	4136	435	0	435	404	0	404	88	0	88	5063	0	5063
Australia	2541	84	2625	157	0	157	236	412	648	189	0	189	3123	496	3619
Austria	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Bangladesh	150	170	320	—	—	—	—	—	—	—	—	—	150	170	320
Belgium	245	60	305	—	—	—	—	—	—	—	—	—	245	60	305
Bolivia	5279	166	5445	—	—	—	536	0	536	—	—	—	5815	166	5981
Brazil	2228	264	2492	1169	51	1220	231	0	231	9	0	9	3637	315	3952
Bulgaria	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Cameroon	125	0	125	2	0	2	—	—	—	—	—	—	127	0	127
Canada	10267	529	10796	1525	0	1525	417	0	417	500	0	500	12709	529	13238
Chad	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Chile	650	22	672	10	16	26	0	25	25	46	0	46	706	63	769
China	1243	0	1243	2717	0	2717	373	0	373	—	—	—	4333	0	4333
Colombia	961	15	976	1159	50	1209	574	100	674	—	—	—	2694	165	2859
Congo	—	—	—	14	0	14	—	—	—	—	—	—	14	0	14
Costa Rica	—	—	—	—	—	—	35	0	35	—	—	—	35	0	35
Czechoslovakia	563	—	563	—	—	—	—	—	—	—	—	—	563	0	563
Denmark	7730	377	8107	—	—	—	—	—	—	—	—	—	7730	377	8107
Dubai	—	—	—	17	0	17	—	—	—	—	—	—	17	0	17
East Germany	250	0	250	—	—	—	—	—	—	—	—	—	250	0	250
Ecuador	494	0	494	231	0	231	—	—	—	—	—	—	725	0	725
Egypt	152	168	320	75	0	75	—	—	—	—	—	—	227	168	395
France	930	800	1730	350	0	350	169	0	169	—	—	—	1449	800	2249
Greece	70	0	70	50	0	50	—	—	—	—	—	—	120	0	120
Guatemala	—	—	—	237	0	237	—	—	—	—	—	—	237	0	237
Honduras	—	—	—	160	0	160	—	—	—	—	—	—	160	0	160
Hungary	344	—	344	188	0	188	112	0	112	—	—	—	644	0	644
India	786	0	786	18	0	18	336	0	336	620	0	620	1760	0	1760
Indonesia	660	37	697	105	0	105	—	—	—	—	—	—	765	37	802
Iran*	(1368)	0	(1368)	(1000)	—	(1000)	—	—	—	—	—	—	(2368)	0	(2368)
Iraq	400	250	650	2066	0	2066	1011	0	1011	—	—	—	3477	250	3727
Ireland	0	159	159	—	—	—	—	—	—	—	—	—	0	159	159
Italy	726	285	1011	—	—	—	—	—	—	—	—	—	726	285	1011
Ivory Coast	—	—	—	31	0	31	—	—	—	—	—	—	31	0	31
Japan	1080	0	1080	—	—	—	—	—	—	—	—	—	1080	0	1080
Kenya	—	—	—	—	—	—	248	0	248	—	—	—	248	0	248
Korea	—	—	—	450	0	450	—	—	—	—	—	—	450	0	450
Kuwait	89	0	89	400	35	435	0	23	23	—	—	—	489	58	547
Libya	0	58	58	723	481	1204	—	—	—	—	—	—	723	539	1262
Malaysia	220	0	220	—	—	—	—	—	—	—	—	—	220	0	220
Mexico	0	68	68	399	0	399	1160	151	1311	—	—	—	1559	219	1778
Netherlands	366	0	366	124	0	124	—	—	—	—	—	—	490	0	490
New Zealand	879	65	944	—	—	—	0	105	105	—	—	—	879	170	1049
Nigeria	2496	120	2616	346	0	346	—	—	—	—	—	—	2842	120	2962
Norway	0	531	531	—	—	—	—	—	—	—	—	—	0	531	531
North Yemen	—	—	—	—	—	—	228	0	228	—	—	—	228	0	228
Oman	132	203	335	472	271	743	—	—	—	—	—	—	604	474	1078
Pakistan	483	0	483	—	—	—	—	—	—	—	—	—	483	0	483
Panama	—	—	—	0	78	78	—	—	—	—	—	—	0	78	78
Peru	—	—	—	1017	0	1017	—	—	—	—	—	—	1017	0	1017
Poland	—	—	—	—	—	—	—	—	—	342	0	342	342	0	342
Portugal	—	—	—	—	—	—	69	0	69	—	—	—	69	0	69
Qatar	0	40	40	—	—	—	—	—	—	—	—	—	0	40	40
Saudi Arabia	1642	160	1802	448	155	603	1606	—	1606	—	—	—	3696	315	4011
South Africa	225	0	225	—	—	—	—	—	—	—	—	—	225	0	225
Spain	586	40	626	159	37	196	68	0	68	—	—	—	813	7	890
Sudan	—	—	—	894	0	894	—	—	—	—	—	—	894	0	894
Syria	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

(Continued)

INTERNATIONAL PIPELINE CONSTRUCTION – BY COUNTRIES ..... (Continued)

(Underway, Planned, and Proposed – October 1982)

Country	Total Miles, Gas Pipelines			Total Miles, Crude Oil Pipelines			Total Miles, Products Pipelines			Total Miles, Slurry Pipelines			Total Miles, All Pipelines		
	Planned	Underway	Total	Planned	Underway	Total	Planned	Underway	Total	Planned	Underway	Total	Planned	Underway	Total
Sweden	1350	0	1350	—	—	—	—	—	—	—	—	—	1350	0	1350
Switzerland	7	0	7	—	—	—	—	—	—	—	—	—	7	0	7
Taiwan	—	—	—	160	0	160	170	220	390	—	—	—	330	220	550
Tanzania	—	—	—	—	—	—	678	0	678	—	—	—	678	0	678
Thailand	503	62	565	286	0	286	458	0	458	—	—	—	1117	62	1179
Tunisia	179	329	508	—	—	—	—	—	—	—	—	—	179	329	508
Turkey	0	50	50	280	0	280	250	0	250	—	—	—	530	50	580
Trinidad	45	0	45	—	—	—	—	—	—	—	—	—	45	0	45
United Kingdom	392	292	684	—	—	—	0	138	138	—	—	—	392	430	822
United Arab Emirates	46	0	46	—	—	—	23	0	23	—	—	—	69	0	69
USSR	9600	3622	13222	—	—	—	506	0	506	342	0	342	10448	3622	14070
Uruguay	189	0	189	—	—	—	—	—	—	—	—	—	189	0	189
Venezuela	171	143	314	263	122	385	16	0	16	—	—	—	450	265	715
W. Germany	266	22	288	81	0	81	201	0	201	—	—	—	548	22	570
Yugoslavia	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Zaire	—	—	—	—	—	—	205	0	205	—	—	—	205	0	205
Zambia	—	—	—	—	—	—	380	0	380	—	—	—	380	0	380

Denmark's Dansk Olie & Naturgas A/S has a 134-mile, 30-in. gas line underway from offshore to Kergaard on the west coast of Jutland, and D.O.N.G.'s subsidiary, DORAS, is building a 137-mile, 20-in. oil from the same offshore area (Gorm and Tyra and Dan fields) to Kergaard. Onshore, D.O.N.G. has some 111 miles of lines underway, including dual 0.8-mile, 30-in. crossings across Lillebaelt and dual 18.8-mile, 30-in. crossings across Storebaelt. In the next five years, Danish regional gas utilities will construct some 8200 miles of gas laterals and gas distribution system, while D.O.N.G. completes the gas transmission system.

Norway's Statoil subsidiary Statpipe is moving ahead on plans for construction of its 531-mile, 28, 30, and 36-in. natural gas system in the North Sea to connect the Statfjord Field to a gas treatment plant at Karstø, with a link from the Karstø plant outlet to Sleipner platform, where a separate line from Heimdal Field will connect with the Karstø-Ekofisk line. All gas received at Ekofisk will move to Emden via an existing gas line.

Newest major gas line in the North Sea to be announced is Shell's proposed 163-mile, 16-in. line from its Fulmar Field in the U.K. sector to the St. Fergus, Scotland gas terminal. Probable construction date is 1984.

In Italy, work continues on the 48-in. Trans-Mediterranean Pipeline, the big gas line that crosses Italy from south to north and terminates near Minerbio. By late 1982, construction crews expect to reach Civita Castellana, with the remaining 200 miles of 48-in. to be installed in 1983.

Sweden's state power board, Vattenfall, is investigating the possibility of building a gas trunk pipeline to link northern Norwegian discoveries through Sweden to West Central Europe. Project would have two phases – first, northern Norwegian gas to Sweden and then via Sweden to Finland and Norway; second, northern Norwegian gas via Sweden to western Central Europe. Project time frame is as early as 1990. Current estimates are that some 1100 miles of large diameter line would be needed. Norway is also reported to be studying an alternative route to bring the northern Norwegian gas directly south via Norwegian territory.

The regional gas utility in Sweden, Sydgas, is moving ahead with plans to build in 1984 a 185-mile gas trunk line from Malmo to Halmsted; gas would be supplied from Denmark via a 65-mile, 24-in. line from north of Copenhagen to Malmo.

Other major European projects underway and nearing completion include Ireland's 159-mile, 18-in. gas line from Dublin to Cork – to be the backbone of Ireland's major gas distribution grid.

British Gas Corp. has completed the final phases in Scotland of its 283-mile, 42-in. Fourth Feeder Line, and work is progressing on the initial 50 miles of the 138-mile, 20-in. natural gas liquids line in Scotland between St. Fergus and Mossmoran. In France, work is being completed on 225 miles of gas lines, while in West Germany, work is progressing on an 81-mile, 22-in. oil line between Hamburg and Wilhelmshaven. Spain's Enagas is reported to be planning some 1500 additional miles of gas lines to be built by the end of 1985.

Middle East and Africa

In the Middle East and Africa, pipeline activity is quite intensive in terms of both lines under construction and lines planned, with 3339 miles underway and 21,084 miles planned for 1983 and beyond. Included are 9927 miles of gas pipelines, 6181 miles of oil pipelines, and 4976 miles of products and natural gas liquids lines.

For 1983, nearly 2500 miles of pipelines are expected to be completed in Saudi Arabia, including 400 miles of crude oil lines and 1500 miles of products and NGL gathering lines. In Oman, some 474 miles of oil and gas lines are underway; in Qatar, 40 miles of gas lines; in Kuwait 58 miles of gathering lines. Work in Libya continues on some 500 miles of pipeline, while in Algeria, current construction includes a 265-mile, 48-in. oil line and a 393-mile, 30-in. oil line; two major 320-mile projects are expected to begin in early 1983 when contract agreements are completed. In Tunisia, work is planned on 250 miles of various gas laterals for STEG.

Other major projects in Africa of super-project size include the 2500-mile large diameter (36 or 42-in.) gas pipeline from Nigeria's Bonny Field to the Mediterranean coast (for ultimate delivery to western Europe); 120 miles of 24-in. gas pipeline elsewhere in Nigeria; 900 miles of large diameter oil line in Sudan planned by Chevron and the Sudan government to transport oil from the Unity field to tidewater – plans for a refinery have been deferred; 650 miles of various size products pipelines proposed in Tanzania, to be built in 1984 and 1985, and 250 miles of products lines planned for Kenya.

S.E. Asia, Pacific, Australia, New Zealand

In Australia, the 411-mile, 14-in. gas liquids pipeline from Moomba in the Cooper Basin south to Stony Point on the

Italy's 48-in. Trans-Mediterranean Pipeline crosses rugged mountains and farmland valleys along its route from south to north; this view of pipe gang moving up-slope is from in the south of Italy.

Spencer Gulf, being built for Santos Ltd., is nearing completion. Some 60 miles of oil and gas gathering lines in the Cooper Basin are underway. Construction contracts are expected to be finalized by the end of 1982 for the 921-mile, 20 and 26-in. Perth to Dampier gas pipeline to be built for the State Energy Commission of Western Australia. Work on the 80-mile, 40-in. offshore gas pipeline in the Northwest Shelf area is underway and is scheduled to be completed in early 1983.

During the next three to five years, Australia and New Zealand will experience substantial pipeline activity – 4000 miles of gas, oil, products, and slurry pipelines are planned and most are expected to be built in that timeframe. New Zealand's current major project is a 105-mile, 10-in. products line between Marsden Point and Wiri.

Ready for the pull. Crew from Nacap prepares to pull section of pipe for river crossing along route of the St. Fergus-Mossmoran gas liquids pipeline in Scotland.

Some 489 miles of pipeline projects are underway in Southeast Asia, Taiwan, Korea, and Japan, and 6668 miles of new lines are planned in this vast area. Major projects underway include 170 miles of gas pipelines in Bangladesh; 38 miles of gas line in Indonesia and 220 miles of gas line in Pakistan. The Thai government's approval of gas exports (as LNG) is expected to spur plans for both offshore and onshore gas pipeline work. Two lines proposed involve underwater lines from existing platforms to shore in southern Thailand – one from the Union Platform (131 miles) and one from the Texas Pacific platform (130 miles).

Taiwan plans 160 miles of oil lines and 170 miles of products line and is presently building 218 miles of products lines. Korea plans a major project involving 450 miles of oil pipelines. In Japan, major pipeline plans include 1060 miles of gas pipelines, most of them related to bringing gas from the Sakhalin Peninsula in the U.S.S.R. to Hokkaido and then south to Honshu.

South and Central America, Mexico

Mexico's pipeline activity has been slowed considerably by economic difficulties and declining markets for its export oil. Regardless, during 1982 Pemex reportedly has constructed some 3100 miles of new pipelines and for 1983 has plans for 1559 miles of oil and products pipelines.

In Panama, work is being completed on the 78-mile oil pipeline across the Isthmus, which will permit tankers from Alaska to unload on the West Coast and transfer loads to tankers on the East Coast, avoiding a long, costly trip through the crowded Panana Canal.

Throughout South America, projects abound, most of them related to movement of natural gas and oil from remote production areas to population centers. Beginning dates for many of the projects have slipped because of economic conditions or political conditions, but most remain feasible and desirable. Argentina, for example, has plans for over 4000 miles of new gas pipelines. Bolivia is planning over 5000 miles of new gas lines, while Brazil is planning 2500 miles of gas lines – and has a new proposal, a 480-mile line to deliver oil to Paraguay.

Colombia is planning over 950 miles of gas lines and 1150 miles of oil pipelines; Chile is working on design of a 400-mile gas line, and Peru is planning a 600-mile oil pipeline.

Canada

Canadian pipeline activity has been excellent in 1982 with a number of major projects completed and underway. Outlook for 1983 was dealt a blow with the two-year delay on construction of the Alaskan Highway Gas Pipeline Project, but the huge 48 and 56-in. line is expected to be built later. Meanwhile, Canada is looking at plans for the Trans-Quebec and Maritimes project (over 1000 miles of line), and numerous other smaller projects to fill in the gaps. The Polar Gas Project remains viable and prospects for new gas lines, oil lines, and even a 500-mile slurry line are considered good.

Soviet Union

U.S.S.R.'s big 56-in. gas line from western Siberia to the U.S.S.R. – Czechoslovakian border has mustered great attention throughout the world – overshadowing other pipeline activity and plans behind the Iron Curtain. The Soviet five-year plan for 1981-1985 calls for 20,000 miles of gas pipelines (10,375 miles to be 56-in. diameter) plus over 7000 miles of oil lines and 4000 miles of products lines. Part of these lines have been built, and P&GJ's survey indicates that the remainder probably will be built.

P&GJ